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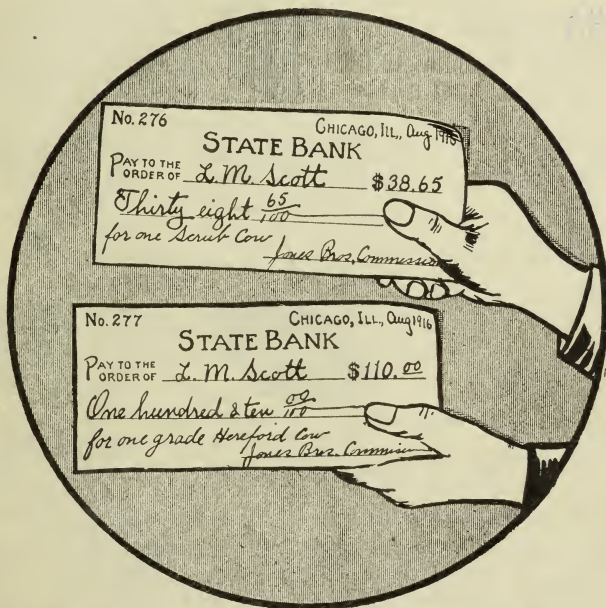
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Circular 121

Ag Sum

February, 1920

Purebred Bulls Pay

D. S. BULLOCK



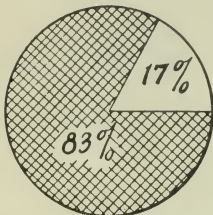
Which will you take ?

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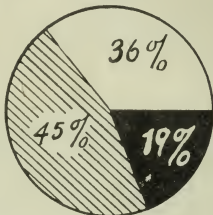
MADISON
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PUREBRED BULLS PAY

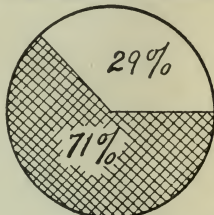
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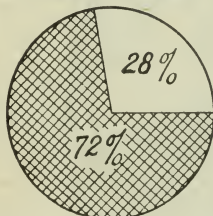
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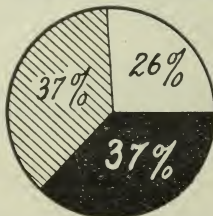
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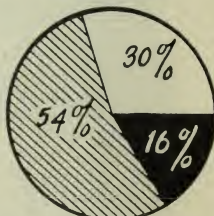
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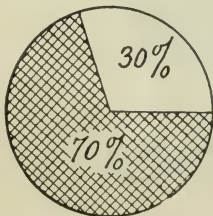
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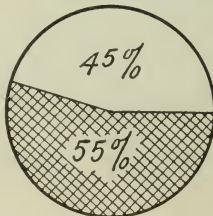
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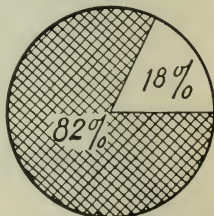
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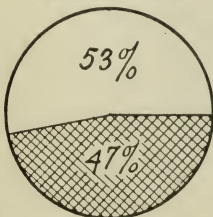
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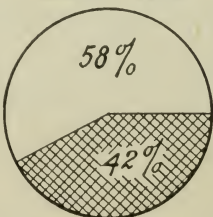
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OCTOBER - 1918



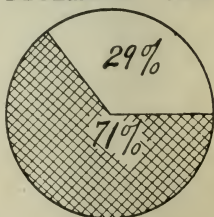
WALWORTH
APRIL - 1919



WAUKESHA
APRIL - 1919



WINNEBAGO
DECEMBER - 1918



PURE BRED
 GRADE
 GRADE & SCRUB
 SCRUB

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Ag. Sec.

Purebred Bulls Pay

A cattle census, taken in 21 counties, shows that even in Wisconsin much too large a number of farmers are using scrub and grade bulls. Although Wisconsin is a leader as a dairying and meat-producing state the grade and scrub bulls outnumber the purebred bulls in all but three of the counties where the census was made. Even in our splendid state not more than one bull in every three now in service is a purebred.

It is estimated that of Wisconsin's approximately 1,800,000 dairy cows 1,200,000 are now being bred to grade and scrub bulls. This means that there are thousands of heifer calves which the better buyers will not buy, simply because they are not sired by purebred bulls.

If all the cows in Wisconsin were bred annually to good purebred bulls it would be possible to sell each year many thousand more grades than are now being sold and still keep as many of the best to replenish our own herds. With these grades rated at but \$75 a head, the annual increase in valuation over the entire state might easily reach the million dollar mark.

Cow-testing association reports show that cows sired by purebred bulls produce annually from 49 to 85 pounds more butterfat apiece than cows sired by grade or scrub bulls.

At only 25 pounds a cow, if those 1,200,000 cows were sired by purebreds instead of grades and scrubs, the increased production would be 30,000,000 pounds of butterfat.

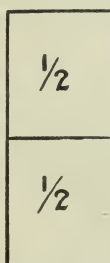
At 50 cents a pound 30,000,000 pounds of butter would amount to \$15,000,000 annually.

In view of these facts how can any farmer in Wisconsin afford to use anything but a purebred bull?

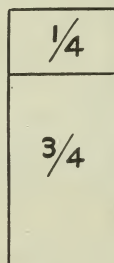
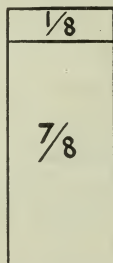
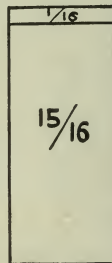
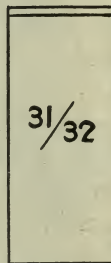
PUREBRED BULLS PAY

WHY THE PURE BRED?

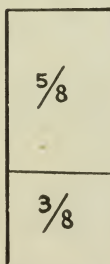
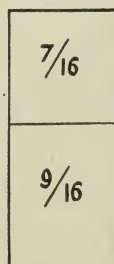
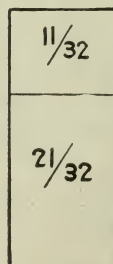
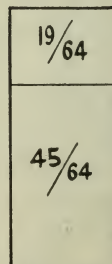
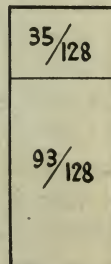
USING PURE BRED BULLS & NATIVE COWS
PROGRESS IN FIVE GENERATIONS.



FIRST CROSS

2ND CROSS3RD CROSS4TH CROSS5TH CROSS

USING GRADE BULLS ($\frac{3}{4}$ PURE BRED) & NATIVE COWS

1ST CROSS2ND CROSS3RD CROSS4TH CROSS5TH CROSS

GRADE BULLS LIMIT IMPROVEMENT.

USE PUREBRED BULLS TO PRODUCE GRADE COWS

The man with an ordinary native herd often feels that it is a waste of money to use a purebred bull on such a herd. It is a common practice to use a grade bull first and then, later, a purebred. The purebred bull does away with the native blood much more rapidly than does a grade bull. In crossing native cows with a purebred bull of any breed, the first cross will be what we know as a halfbreed; that is, half the blood in the offspring is from the purebred sire.

To breed up a good grade herd and get rid of the native blood as rapidly as possible the quickest method is the successive use of purebred bulls. In five generations (see chart) only one thirty-second of the native blood remains. As far as production, either of meat or dairy products, is concerned, these high grades may be as good as purebreds, if proper care has been exercised in selecting, breeding and feeding.

Where a grade bull, even one which is three-fourths purebred, has been used through five successive generations, there still remains more than one-fourth of native blood. No matter how long you continue the use of grade bulls of this class that one-fourth native blood will still remain.

“A grade cow is one sired by a purebred bull and out of a cow not a purebred.”

A purebred is one whose sire and dam are both purebreds of the same breed. The only positive evidence we have that an animal is a purebred is the registration papers. A registered animal is a purebred which has been registered with the national registry association of that particular breed.

BUYERS DEMAND THE OFFSPRING OF PUREBRED BULLS

Wisconsin is supplying a large amount of breeding stock of the dairy breeds for other states, 35,888 head having been shipped out of Wisconsin in one year.

Quite a few of these animals were purebreds, both cows and bulls, but by far the greater number were high grades, the offspring of purebred sires and high-producing dams.

Buyers from outside of Wisconsin are careful to get good animals, the produce of good sires and, if of breeding age, bred to purebred sires. They are continually refusing to take animals bred to anything but purebred sires of the same breed.

SOME TYPICAL REQUESTS RECEIVED

"Please state if the heifers and cows would be bred to a purebred bull or grade."—M. W. Wall, N. C.

"Would like them to be high grades and from known high-producing ancestry."—Calvin Perdue, Ind.

"I plan to go to your state sometime soon to purchase one or two cars of high-grade Holsteins and Guernseys."—S. W. Houston, La.

"Now we would not want registered stuff, but would want good grades, not less than three-fourths."—E. W. Hamiter, La.

"Will you be able to locate a car of high-grade Holstein heifers for our farmers, from purebred sires and out of good high-grade dams?"—R. L. Blackwell, Ga.

"The North Judson bank of Indiana wishes to purchase a car load of high-grade Holstein heifer calves for distribution in calf club work."—C. A. Buechner, Ind.

PUREBRED BULLS PAY

A WAUPACA COUNTY HERD

OWNED BY A WOMAN

IN 1905 CONSISTED OF 12 NATIVE COWS

TOTAL INCOME IN 1905, \$ 438.88

\$ 438.88

IN 1905 BOUGHT PURE BRED BULL.

IN 1910 HERD CONSISTED OF 12 GRADES.

(FIVE COWS AND SEVEN HEIFERS)

ALL DESCENDANTS OF COWS OWNED IN 1905.

TOTAL INCOME IN 1910, \$ 1,000

\$ 438.88

\$ 561.22

**INCREASED RETURNS DUE TO USE OF
PURE BRED BULLS \$561.22**

PURE BRED BULLS INCREASED RETURNS 128%

**THE BULL WAS MORE
THAN HALF THIS HERD**

THE BULL IS HALF THE HERD

The chart on the opposite page shows briefly the story of five years' improvement in one herd. Mrs. Henry F. Ora, of Manawa, Wisconsin, built up a profitable grade herd from common native stock by the use of purebred bulls. Her capital in 1905 consisted of a small farm with a mortgage on it and a herd of 12 scrub cows. Here is her own story of what she did:

"Our twelve scrub cows were returning us \$438.88 annually. This was far from satisfactory, so I borrowed the money to pay for a purebred Guernsey bull, asking myself the question 'Will he pay for himself?' I can now answer that question and I can add that he has not only paid for himself but he has paid compound interest also. He enabled us to build a silo, buy machinery, educate the children, and remove all indebtedness from the farm.

"In five years our herd still consisted of twelve head, five of them mature cows and seven of them heifers, and all descendants of the scrub cows we began with. With practically the same prices for feed and for our product, these cows returned us \$1,000, an increase of \$561.12 due to the use of purebred bulls. By systematic testing, culling and careful selection we gradually increased the size and quality of our cows. Today we have a purebred herd of high-producing Guernseys. If I had not gone further in debt to buy that purebred bull back in 1905, someone else would be owning and operating the farm today."

The constant use of a purebred bull in this herd for five years increased the production of 128 per cent. The old saying that "the bull is half the herd" was hardly true in this case. The bull was more than half this herd.

PUREBRED BULLS PAY

PURE BRED BULLS INCREASE MILK & BUTTER FAT PRODUCTION

RESULTS WITH

- 5 SCRUB COWS IN 23 LACTATION PERIODS
 5 1ST CROSS DAUGHTERS IN 21 LACTATION " AND
 5 2ND CROSS GRAND-DAUGH. IN 6 LACTATION "

OFFSPRING BY **PURE BRED BULLS** OF THREE BREEDS

PRODUCTION RECORDS

	DAMS	DAUGHTERS	GRAND-DAUGHTERS
MILK	3660.2 lbs.	5998.7 lbs.	8401.9 lbs.
FAT	171.57 lbs.	261.25 lbs.	358.17 lbs.

INCREASED PRODUCTION DUE TO **PURE BRED SIRES**

DAUGHTERS

MILK 2338.5 lbs. OR 64 PERCENT
 FAT 89.68 " OR 52 "

GRAND-DAUGHTERS

MILK 4741.7 lbs. OR 129 PERCENT
 FAT 186.6 " OR 109 "

(FROM IOWA BULLETIN)

N^o 188

PUREBRED BULLS DOUBLE PRODUCTION

Since 1907 the Iowa Experiment Station has been conducting a series of experiments to show the effect of using good purebred bulls of the dairy breeds on common native stock. The cows used in the experiments were Arkansas "piney woods" bought in a section where no purebred bull of any breed had been used. These cows were bred to purebred bulls, some to each of the three breeds, Guernsey, Holstein and Jersey.

The production records of five of these scrub cows covering a total of twenty-three lactation periods, five first-cross daughters by purebred bulls covering twenty-one lactation periods, and five second-cross grand-daughters covering six lactation periods, are shown in the illustration. The figures are compiled from the report published in Iowa Bulletin 188.

From this chart we see that first-cross daughters by purebred bulls and out of scrub cows were far better producers than their dams. The improvement does not stop with the first cross. The second cross or grand-daughters were also better producers than their dams.

The daughters averaged 2338.5 pounds of milk and 89.68 pounds of butterfat more than their dams. This is an increase of 64 per cent in milk and 52 per cent in butterfat production.

The second generation, grand-daughters of the scrub cows, by purebred bulls, produced 4741.7 pounds of milk and 186.6 pounds of butterfat more than their grand-dams. This increase is 129 per cent in milk production and 109 per cent in butterfat production.

The increased production was not due to better care or feed, for all the animals received practically the same care. The increase was due to better breeding.

Two crosses more than doubled the production,—a striking tribute to the value of the purebred sires.

PUREBRED BULLS PAY

AMHERST-NELSONVILLE COW TESTING ASSOCIATION

REPORT FOR 1918

**15 COWS PRODUCED 365 LBS. OR MORE
OF BUTTERFAT QUALIFYING FOR -
"REGISTER OF PRODUCTION"**

EVERYONE OF 15 SIRED BY PURE BRED BULL.

**NO COW SIRED BY GRADE OR SCRUB BULL
QUALIFIED FOR REGISTER OF PRODUCTION.**

10 HIGHEST HERDS HEADED BY PURE BRED BULLS.

HERDS HEADED BY PURE BRED BULLS AVE.

6350 LBS. MILK ^{AND} 295 LBS. FAT PER COW.

HERDS NOT USING PURE BRED BULLS AVE.

5009 LBS. MILK ^{AND} 215 LBS. FAT PER COW.

DIFFERENCE IN FAVOR OF HERDS

HEADED BY PURE BRED BULLS

1341 LBS. MILK ^{AND} 80 LBS. FAT PER COW.

80 LBS. AT 70¢ = \$56.00 PER COW.

PUREBRED BULLS INCREASE MILK PRODUCTION

The Amherst-Nelsonville cow-testing association is one of the oldest in the state. During 1918 there were 419 cows in the association; 384 of these were in herds using purebred bulls and only 35 in herds using grade and scrub bulls. The report of this association for 1918 shows that purebred bulls increase the production of dairy products.

The average production of the cows in herds using purebred bulls was 6,350 pounds of milk and 295 pounds of butterfat.

The average production per cow in herds using grade and scrub bulls was 5,009 pounds of milk and 215 pounds of butterfat.

This is a difference of 1,341 pounds of milk and 80 pounds of fat in favor of the cow in a herd headed by a purebred bull. At 70 cents a pound for butterfat this amounts to \$56 a cow. The man with eight cows who used a purebred bull produced more milk and butterfat in the year than the man who milked ten cows and used a grade or scrub bull.

Fifteen cows in this association produced 365 pounds or more of butterfat, thus qualifying for the "Register of Production." All these fifteen cows were sired by purebred bulls. There are plenty of cows in associations all over the state that are the offspring of grade and scrub bulls. The reports sent in by cow-testers in 1918 show that not one of these cows qualified for the "Register of Production."

The offspring of grade and scrub bulls are handicapped from the start. They are incapable of producing as much as the offspring of the good purebred sire. Their production is limited and they are thus a drawback to the success of the man who owns them.

PUREBRED BULLS MAKE BETTER BEEVES



THIS SCRUB SIRE
THIS GRADE DAM

PRODUCED



THIS SCRUB

WHICH?



THIS PURE BRED SIRE
THIS SCRUB DAM

PRODUCED



THIS GOOD GRADE

BETTER WISCONSIN CAMPAIGN
(From a Michigan Demonstration)

PUREBRED BULLS A NECESSITY IN BEEF PRODUCTION

The experience of a Wisconsin beef producer with a purebred and a grade Hereford shows a 3 to 1 ratio in favor of the purebred sire. Here is the story L. M. Scott of Bagley tells:

"In the fall of 1915 I took the calves away from two cows the same age, one a scrub and the other a high-grade Hereford. They were fed together on silage and hay until May 10, when they were turned on blue grass pasture, neither being in calf.

"The first week in August, I shipped them with our steers to market. The scrub cow brought \$38.65. The grade Hereford brought \$110. The sires made the difference in price I received for the two cows."

A Michigan demonstration also shows a comparison between results from using a purebred bull on a scrub cow and a scrub bull on a grade cow. The pictures on the opposite page tell the story of this trial.

DOES THE PUREBRED PAY?

"Near a Utah forest two neighbors owned about the same number of cattle, wintering them partly on open public domain ranges supplemented with some roughage near spring. The two herds then entered the forest ranges for the summer season at about the same time, used them for the same number of months, and grazed on practically the same kind of grasses and forage plants while there. Each man paid exactly the same grazing fees and each herd received the same attention from its owners, which I may say was very little. In the fall the steers from the two herds were cut out and shipped the same day on the same train to the same commission house in Omaha, where they were sold the same day under identical market conditions. Both bunches were fat. The purebreds, well-bred Herefords, brought \$2 a hundred weight more in cash than their scrubby brethren, averaged 200 pounds more in weight, and netted their owner exactly \$40 a head more than the scrubs netted their owner." (W. C. Barnes, in *Breeders' Gazette*.)

WHAT TO DO

If purebred bulls pay, and reading the figures given you must admit they certainly do pay, then every farmer in Wisconsin should use one in his herd.

To get one, consult a neighbor who breeds purebreds, ask your county agent to help you get one, write the secretary of your county breeders' association, or the secretary of the Wisconsin Live Stock Breeders' Association, Madison, or the Animal Husbandry Department of the College of Agriculture at Madison.

If you have only a few cows and cannot afford to own a good bull, make arrangements to use your neighbor's, or join in with the community and form a cooperative bull association.

Use a Purebred Bull because you cannot afford not to.

Circular 122

February, 1920

Social Surveys of Rural School Districts

How Made and How Utilized

C. J. GALPIN, G. W. DAVIES, GRACE WYMAN-STONE

EXTENSION SERVICE OF THE COLLEGE OF AGRICULTURE
THE UNIVERSITY OF WISCONSIN



Know your district

AN OPPORTUNITY TO SERVE

Would you not like to do something for Wisconsin,—something that nobody else can do? A special service to your state which you could regard as a share in the peace program of reconstruction? A bit of work which would etch the bounding lines of Wisconsin more deeply into the national map?

While engaged in thus adding to the honor of Wisconsin you yourself could not remain hidden in the usual obscurity surrounding the ordinary rural school teacher. A distinction would come to you. It should not, however, raise an objection in your mind to this line of service to receive some recognition.

Sowing the seeds of civilization in the hearts of the children is doubtless opportunity enough to call forth the best that is in you. But suppose that over and above this rare inducement to your labors, you could take a hand in the material development of your state and see the results of your work maturing from year to year while you are waiting for education to blossom in the spirit of the children! This is precisely the challenge put up to you in the plan set forth in this circular.

The thinking farmers and farm women of Wisconsin are anxious to see rapid community growth in the country districts of the state. The legislature aims to bring this about by months of discussion every two years. The State Department of Agriculture is hard at work to achieve the same result. Many would be happy to have the honor of giving an impetus to rural progress. You, however, have one decided advantage over all these state agencies. You live and work in the midst of the important facts which they do not know and can find out only at great expense, but which you and your school children can know.

It is the purpose of this publication to show how to mobilize the intimate facts of farm life which surround you, how to utilize these facts so as to produce community growth.

You should remember, moreover, Wisconsin school teachers, that community growth waits, waits, waits long sometimes for these facts to become matters of common knowledge. Will you not consent to render a distinguished service to your state and bring these facts of common life to the surface even though you yourself thereby come somewhat into public prominence?

C. J. GALPIN

Social Surveys of Rural School Districts

For the same reason that the business man or the farmer takes an inventory of his resources once a year, a school survey is of value to the pupils who make it, to the teacher who directs it, and to the district in which it is made.

TO THE TEACHERS OF WISCONSIN:

While fully appreciating the fact that your days are already well-filled with the teaching of your many classes and the supervision of your school and its grounds, we appeal to you to put forth every effort you can to know, in addition to the pupils and their parents, your school district, its resources, its industries, and its activities.

The social survey of the rural school district has already made an important place for itself in the work of the progressive, forward-looking teacher. It is of growing importance and is accepted as an important community service.

It is needless for me to urge you to interest yourself in a survey of your district. You already appreciate that need. In making such a survey. I feel certain that you will find this circular of great value to you.

C. P. CARY,

State Superintendent of Public Instruction

A survey gives the teacher facts which go to make the background for the important community service which is to be rendered. The value of a look about the district to bring out facts about the farms, homes, crops, profits, neighborhood

history, local officers, and community progress and prosperity cannot be overvalued. Know your district.

The use of the survey and some of its values to the community and the teacher are brought out in the Manual of the Elementary Course of Study for the Common Schools of Wisconsin,

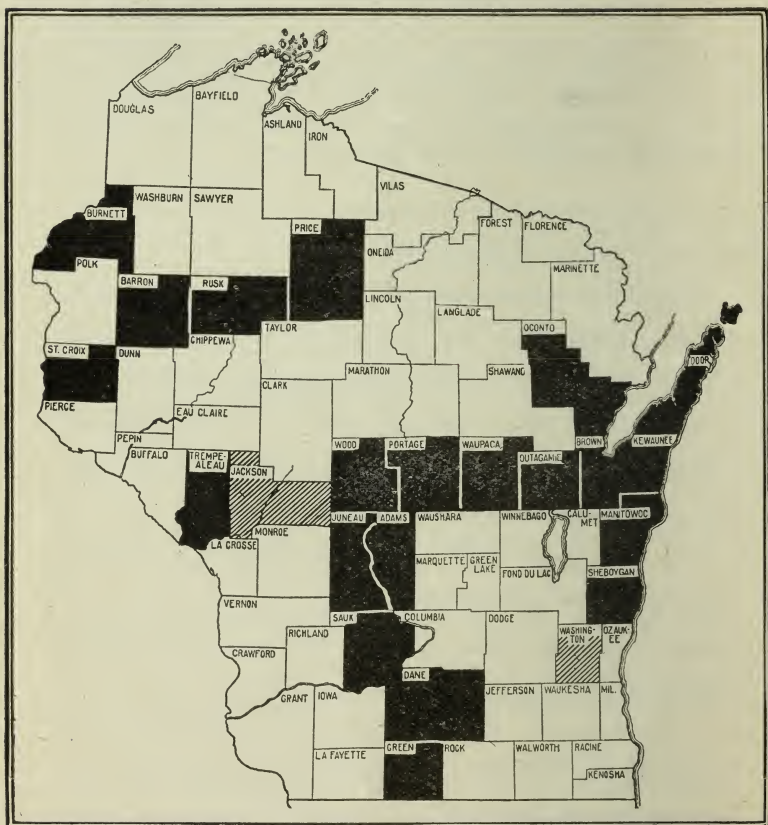


FIG. 1.—KNOW YOUR SCHOOL DISTRICT

Twenty-three Wisconsin counties have made some use of the rural school survey idea. An increasing number of teachers are using surveys in teaching.

published by the state superintendent of public instruction in 1917.

“School survey. A school survey undertaken by the pupils should be made in every school district. It is well to have the pupils make maps of the school district and locate on them silos, factories, clubs of various kinds, etc. Under certain conditions it will be best for the whole school

to undertake it. Through the survey it is possible for a county superintendent to secure some valuable information for his county.

"Have each pupil draw to scale a map of such parts of the school district as are familiar to him. On this map should be placed the houses, barns, and natural features known.

"Community help. For the purpose of getting the best community help and at the same time arousing the best community interest, it is recommended that each teacher select after a careful survey of the community two or three farmers who are best fitted to give advice and help in organizing the practical side of the work."

"Let pupils make a survey to find out how many acres of alfalfa are grown in the district. If little is raised find out why."

The Manual also suggests how local facts may be utilized in the ordinary study work of the school.

LANGUAGE

"The great opportunity of the teacher in the language work of the school is, therefore, to bring before the child in conversation, story, or by other means, language material that will help him in developing the powers of his mind, especially the power of thinking.

"The language work of the school must be correlated with the other school subjects."

ARITHMETIC

"Except in purely mechanical exercises the arithmetic work should be, as far as possible, related to or based upon actual conditions in life. In our day, when there is so much useful and vital information to be had, the schools should eliminate the non-essentials and give the children those things which will be of greatest service to them. These practical life problems would form the basis for the arithmetic work in all the grades.

"The application of the principles of arithmetic to everyday affairs of life is the most important part of the work.

"Farm (or industrial) problems of any nature which may profitably be worked in the class. These will vary in different localities.

"Problems growing out of home activities may be introduced if they are based upon real conditions existing in the community. Unless so-called 'practical' or 'indus-

trial' problems can be made real they should not be introduced."

GEOGRAPHY

"The industry or industries most common in the district should be carefully studied."

HISTORY

"History is closely related to the other school subjects and in the teaching this relation should be shown. Geographical facts that have a bearing upon historic events should be taught or reviewed when these events are studied."

CIVICS

"Bring out the fact that the welfare of each home depends upon the welfare of the whole community and that the welfare of the community depends upon the welfare of each home. All should work together for the common good. Give instances to show results that have been achieved through cooperation."

UTILIZING THE SURVEY

It certainly would be foolish to go hunting for game which one did not care to use in any way. The bare sport of killing rabbits, wild ducks, and deer would scarcely justify hunting. It is the use, or utilization, of game which really warrants the hunt.

In like manner, a search for the things of knowledge is unwise unless the things are to be used in some way after they are obtained.

Using the results of a survey, therefore, is after all the really important thing about a good survey.

The local facts of the school district survey, when once collected, may be utilized by the teacher, by the pupils, and by the people who live on the farms.

STEPS IN MAKING THE SURVEY

Time of the year to make the survey. The teacher should decide upon a week early in the fall, probably in October, certainly not later than November, in which to make the survey.

There are several good reasons for a survey early in the year.

It takes some time to get the facts of the survey in shape to be used in teaching. A late start, therefore, will deprive the school of some of the chief benefits.

Children are fresh for such an extra enterprise in the fall.

Then the new teacher, and every year many teachers are new, really needs to look about her and get acquainted with the habits and achievements of the people of her district at the very beginning of the year.

Blank schedules on questions. The teacher may be able to obtain from the county superintendent the necessary blank schedules or questions.

There can be, all told, three sets of these blanks used in the county.

1. One set of blanks can be provided in each school district of the county, sufficient in number to give one blank to each farm in the school district. This may be called the "Farm Schedule Blank."

2. A second set of blanks can be provided for each school district in the county, upon which to summarize the facts obtained from the farm schedules in that district. In this set only three or four copies are necessary for each teacher. This blank may be called the "District Summary Blank."

3. A third set of blanks can be provided for each township in the county, upon which to summarize the facts obtained in the different districts of the township. A sufficient number of copies of this blank can be provided in each township so that each school district may have a completed summary and the county superintendent one and, possibly, the state superintendent one.

Who shall make the survey? Each time a school survey is made, the teacher is the director of the survey. The pupils work in cooperation with the teacher. The parents at home lend their full aid to the pupils. In cooperation, therefore, of teacher, pupils and parents, the survey of the school district is made.

How to collect the facts. The first step in the survey is to get the farm schedules filled out so that every question on each farm schedule blank is answered accurately.

There are two methods of filling in these blanks. One of them, however, is the better, and should be used in every case, if possible.

The first way, which will possibly occur to each teacher, is to send to each farmer, by the children, a copy of the blank schedule for the family to fill out at home.

The second and much better method is for the teacher to keep the blank schedule herself and not let it go out of her hands,

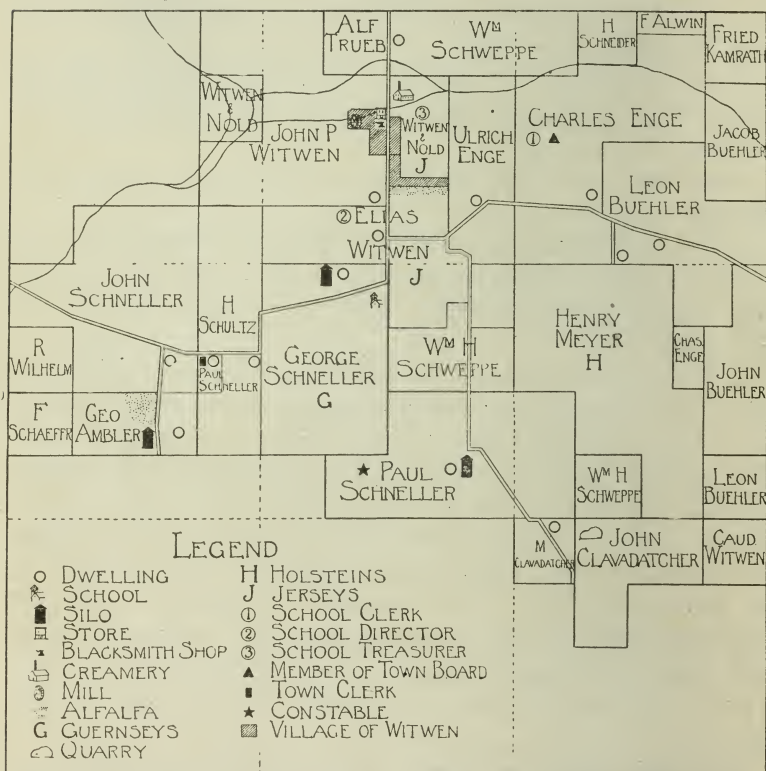


FIG. 2. SOCIAL MAP OF A COUNTRY SCHOOL DISTRICT

The data of this chart were collected by a pupil in District No. 8 school, Troy township, Sauk county, Wisconsin. What more effective means of teaching geography, history, arithmetic and civics could be devised than the making of a survey which intimately acquaints the child with his whole community?

but to fill in with her own hand each schedule, as the information is brought in by the pupils.

There are two methods of getting the information from each farm. One method is to get all the facts contained in the whole schedule at one time. This is a difficult thing to accomplish, and is likely to lead either to mistakes or to a hurried and imperfect set of answers.

The better method of collecting the facts is to select questions about one topic and bring these in on one day, then to select questions on another topic and bring in the second day, and so on. This method does not overload the patience of the family and concentrates everybody's attention upon one set of facts and leads to a full and accurate statement.

SCHOOL DISTRICTS WHICH CARRIED OUT THE RURAL STUDY PROJECT
DANE COUNTY, WIS.

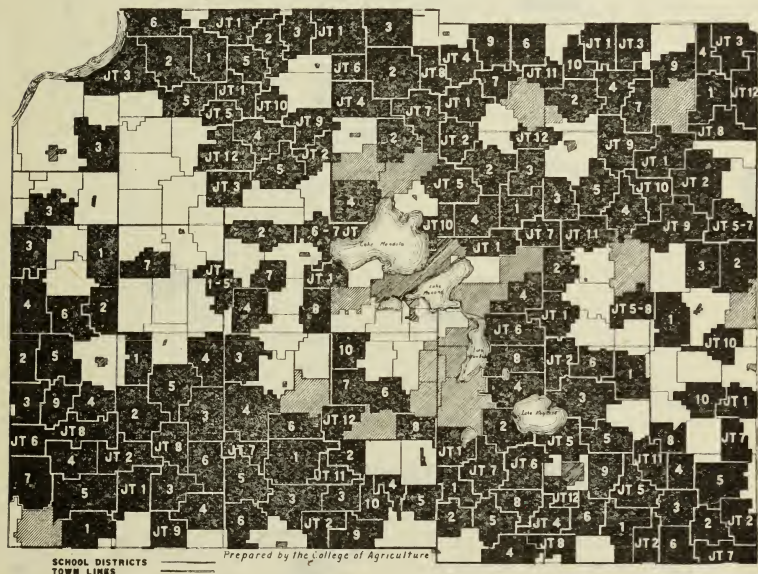


FIG. 3.—COVER COUNTY IN SURVEY

Quite a complete survey of Dane county has been made by the rural school teachers. The facts obtained for the county are shown in the charts which follow.

HOW TO MAKE A MAP OF THE SCHOOL DISTRICT

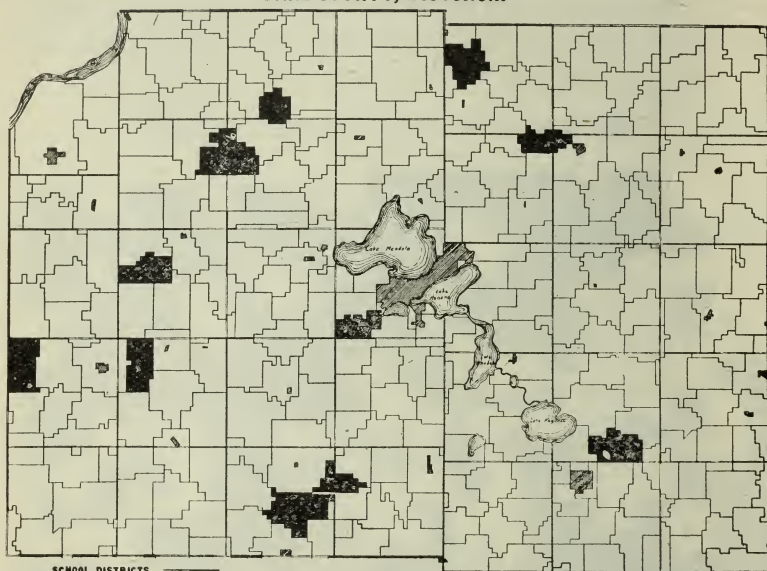
Materials used. Let each pupil make his own map on rather heavy, smooth white paper. A uniform paper for a school, if not for a county, is preferable. Colored inks may be used for the lines with water-colors for different areas; or the whole map may be in black, like the map reproduced in the cut. (Fig. 2.)

Size and scale. Draw the first map as large as the black-board will allow. The individual paper maps may be drawn to the uniform scale of three inches to the mile.

A Convenience for the Whole Family

DISTRICTS WITH RUNNING WATER IN $\frac{1}{4}$ THE HOMES

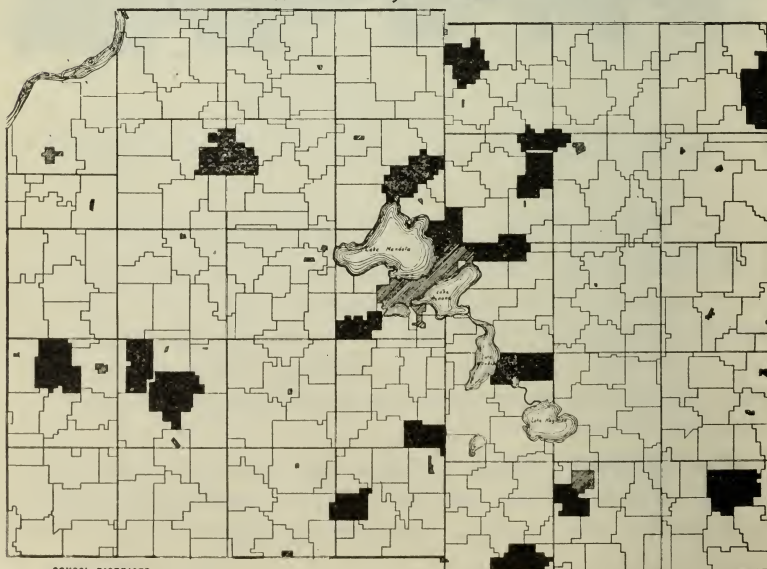
DANE COUNTY, WISCONSIN



SCHOOL DISTRICTS
TOWN LINES

DISTRICTS WITH BATHROOMS IN $\frac{1}{4}$ THE HOMES

DANE COUNTY, WISCONSIN



SCHOOL DISTRICTS
TOWN LINES

INDIVIDUAL FARM SCHEDULE

No. of persons in your family	No. of dairy cattle you have	No. of grade dairy cattle	No. of registered dairy cattle	Of what breed are the purebred cattle	No. of beef cattle	No. of pigs you raised in 19....	No. of chickens you raised in 19....	No. of sheep and lambs you raised

When answering the first question above, include all regularly hired labor or other persons usually living with you.

When answering questions 2, 3, 4, 5, and 6, include all cows, heifers, calves and sires.

Name of township District No.

Name of farmer or head of the family P. O. address

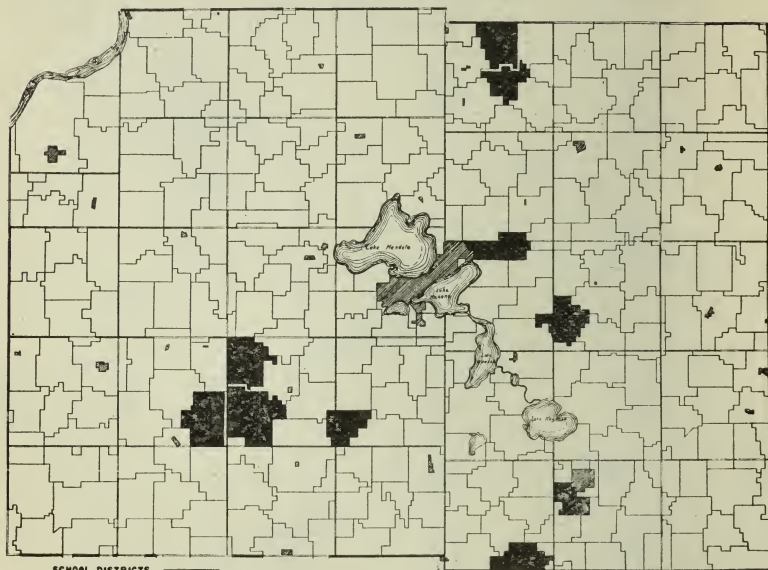
In the blank spaces below write the answers to the following question regarding crops raised on your farm.

No. of acres of corn for grain	No. of bushels of corn for grain	No. of acres of oats	No. of bushels of oats	No. of acres of potatoes of potatoes	No. of bushels of potatoes	No. of tons of corn silage	No. of acres of hay—clover and timothy	No. of acres of wheat

Wash Day is Easier for These Mothers

DISTRICTS WITH POWER WASHERS IN $\frac{1}{4}$ THE HOMES

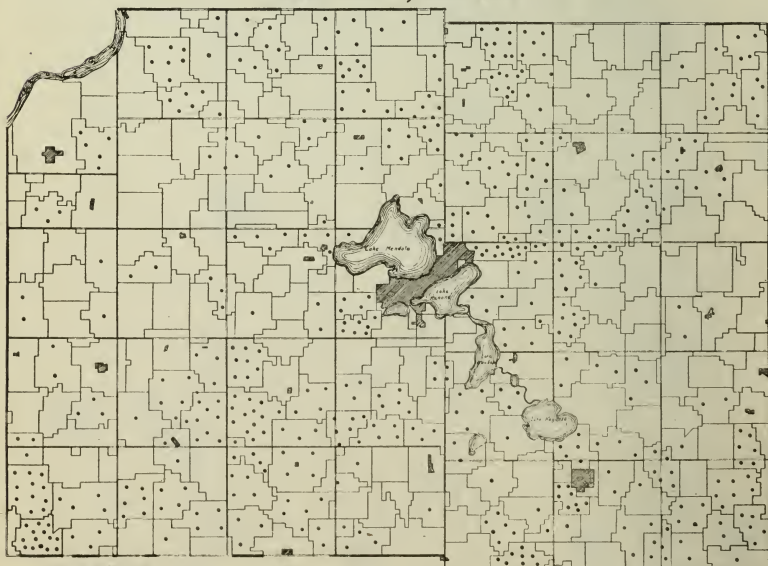
DANE COUNTY, WISCONSIN



SCHOOL DISTRICTS
TOWN LINES

NUMBER OF POWER WASHERS IN SCHOOL DISTRICTS

DANE COUNTY, WISCONSIN



SCHOOL DISTRICTS
TOWN LINES

INDIVIDUAL FARM SCHEDULE

[illegible]

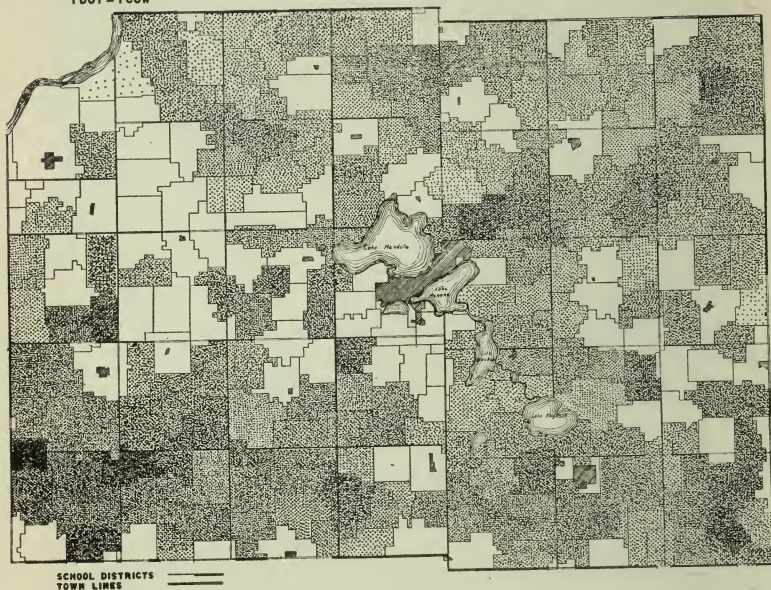
Put an x in the square against the farm and home conveniences that are on this farm, except when the actual number is asked for.

Dots Show Dairy Progress

NUMBER OF DAIRY COWS IN SCHOOL DISTRICTS

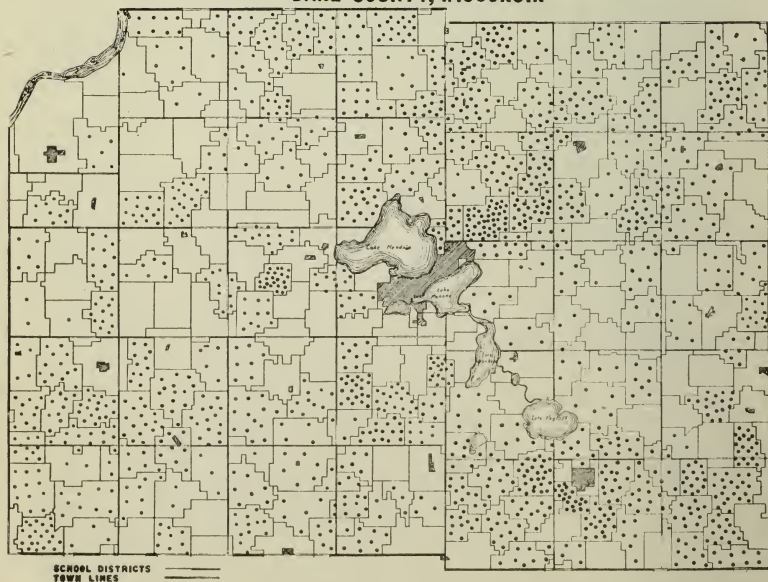
1 DOT = 1 COW

DANE COUNTY, WIS.



NUMBER OF SILOS IN SCHOOL DISTRICTS

DANE COUNTY, WISCONSIN



DISTRICT SUMMARY SCHEDULE

No. of farms in the district	No. of families on farms	No. of grade dairy cattle	No. of registered dairy cattle	Give names of the breeds of purebred cattle	No. of beef cattle	No. of pigs	No. of chickens	No. of sheep and lambs

When answering the question regarding the number of families on farms, remember that there may be more than one family on some farm.

Name of township District No.

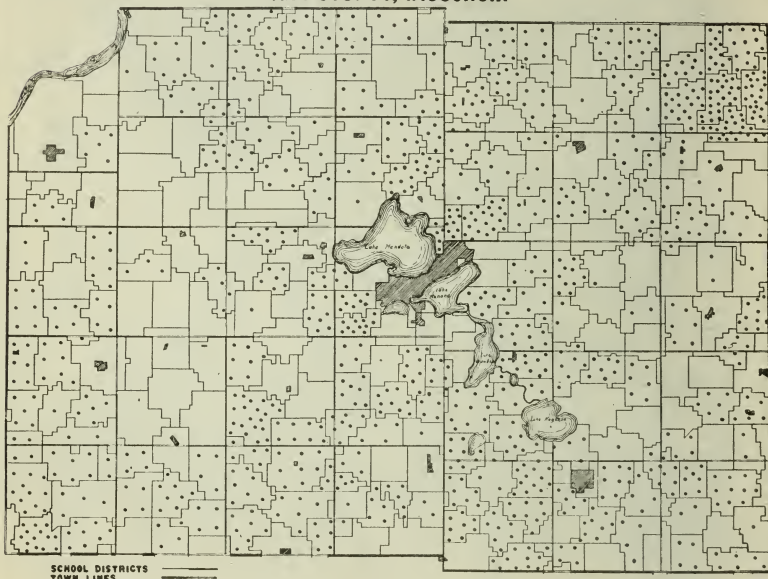
In the blank spaces below write the answers to the following questions regarding crops raised in the district.

No. of acres of corn for grain	No. of acres of oats	No. of bushels of corn for grain	No. of bushels of oats	No. of acres of potatoes	No. of bushels of potatoes	No. of tons of corn-silage	No. of acres of hay—clover and timothy	No. of acres of wheat

Music in the Home, Milking Machines in the Dairy

PHONOGRAPHS IN FARM HOMES

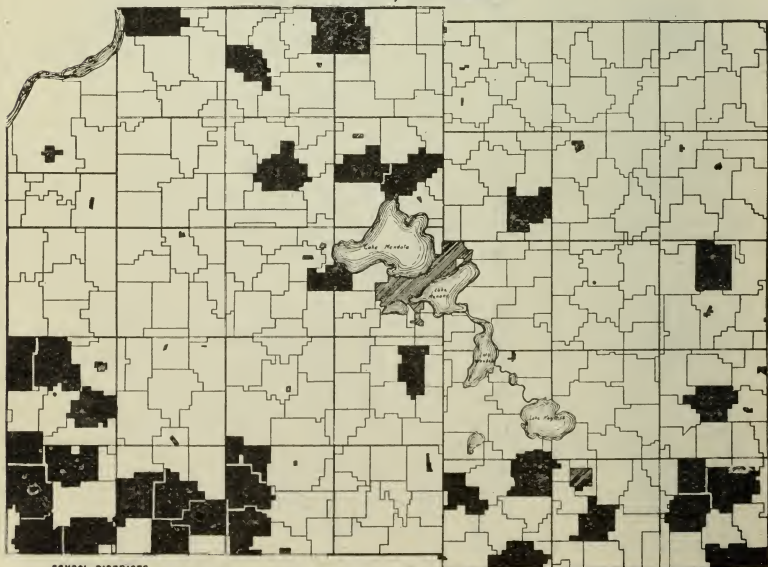
DANE COUNTY, WISCONSIN



SCHOOL DISTRICTS
TOWN LINES

DISTRICTS WITH MILKING MACHINES IN $\frac{1}{4}$ THE HOMES

DANE COUNTY, WISCONSIN



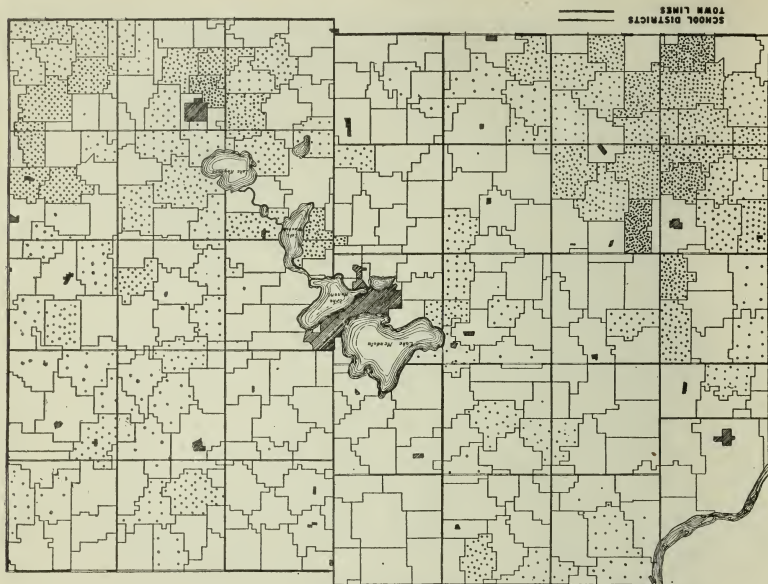
SCHOOL DISTRICTS
TOWN LINES

DISTRICT SUMMARY SCHEDULE

No. of acres of alfalfa	No. of farms reporting alfalfa	No. of acres of green peas	No. of acres of sweet corn	No. of acres of tobacco	No. of acres of cabbage	No. of acres of field peas	No. of acres of flax
(These questions are to be answered only when the crops are grown as field crops.)							
FARM CONVENIENCES				HOME CONVENIENCES			
— Automobile					— Telephone		
— Windmill					— Electric lights		
— Gasoline engine					— Gas lights		
— Incubator					— Furnace heat—air, water or steam		
— Brooder					— Cold running water at sink		
— Silo—give number					— Hot running water at sink		
— Milking machine					— Pump at sink		
— Milk scales					— Power washer		
— Easy stanchions					— Bathroom		
— Litter carrier					— Piano		
— Road drag					— Phonograph of any kind		
— Tractor					—		
—					—		

In the blank space against the name of each farm and home convenience, give the number of each found in your district.

Where the Hay Crop Grows

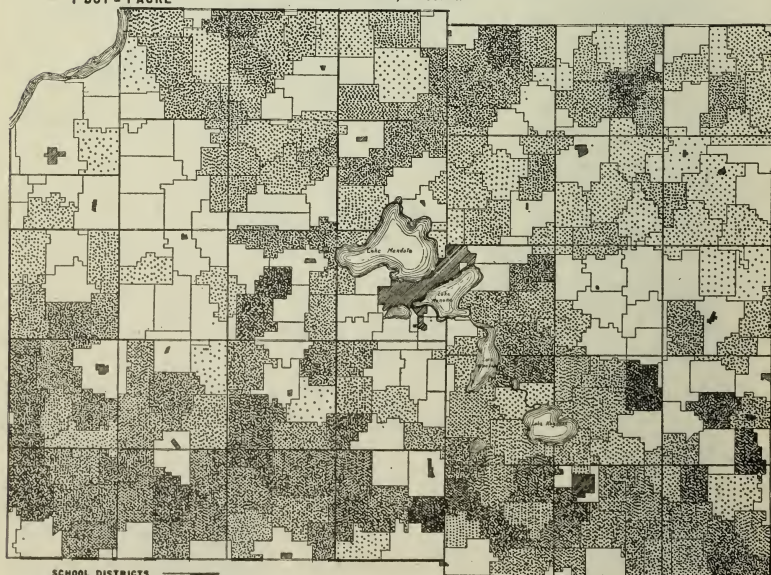


ALFALFA IN SCHOOL DISTRICTS
DANE COUNTY, WISCONSIN

TIMOTHY AND CLOVER(MIXED) IN SCHOOL DISTRICTS

1 DOT = 1 ACRE

DANE COUNTY, WISCONSIN



TOWNSHIP SUMMARY SCHEDULE

No. of farms	No. of families on farms	No. of dairy cattle	No. of grade dairy cattle	No. of registered cattle	Give names of the breeds of cattle	No. of beef cattle	No. of pigs	No. of chickens	No. of sheep and lambs

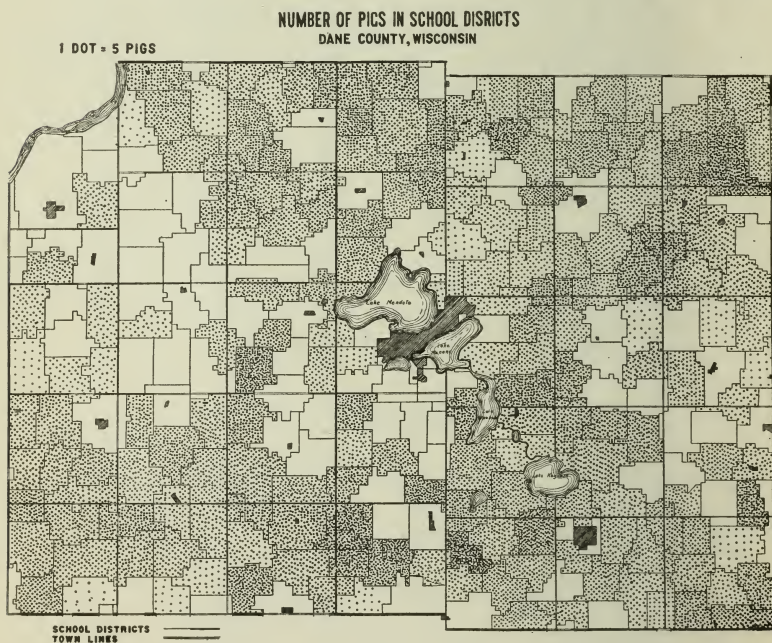
Name of township

In the blank spaces below write the answers to the following questions regarding crops raised in the township.

No. of acres of corn for grain	No. of bushels of corn for grain	No. of acres of oats	No. of bushels of oats	No. of acres of potatoes	No. of bushels of potatoes	No. of tons of corn shlage	No. of acres of hay—clover and timothy	No. of acres of wheat

Locate each farm. In Wisconsin, where land is laid out in sections of one square mile each, it will be easy to locate any farm. First draw the section and quarter section lines and locate the school. Then locate the outside bounding lines of the farm on which or next to which the school house stands. Next locate in like manner adjacent farms until every farm in the school district is on the map.

In a state where there are no section lines it would be difficult to make an accurate map. However, a fairly serviceable



set of boundaries might be obtained by starting from a given stream, road, or range of hills or bluffs, locating the school, and then the farms as nearly as possible.

Locate important social features. (a) Include village, if any, (b) highways, (c) large streams, (d) town hall, (e) homes, (f) churches, (g) creameries, (h) cheese factories, (i) farmers' clubs, (j) grist mill, (k) saw mill, (l) nature's beauty spots, etc.

A set of maps may be made showing, one at a time, the prominent features of the district. For this purpose the main features described above, such as farm boundaries and farm homes, roads, streams, etc., may be represented uniformly in each map.

TOWNSHIP SUMMARY SCHEDULE

No. of acres of alfalfa	No. of farms reporting alfalfa	No. of acres of green peas	No. of acres of sweet corn	No. of acres of tobacco	No. of acres of cabbage	No. of acres of field peas	No. of acres of flax

(These questions are to be answered only when the crops are grown as field crops.)

FARM CONVENIENCES

- | | |
|------------------|-------|
| Automobile | _____ |
| Windmill | _____ |
| Gasoline engine | _____ |
| Incubator | _____ |
| Brooder | _____ |
| Silo—give number | _____ |
| Milking machine | _____ |
| Milk scales | _____ |
| Easy stanchions | _____ |
| Litter carrier | _____ |
| Road drag | _____ |
| Tractor | _____ |

HOME CONVENIENCES

- | | |
|----------------------------------|-------|
| Telephone | ..... |
| Electric lights | ..... |
| Gas lights | ..... |
| Furnace heat—air, water or steam | ..... |
| Cold running water at sink | ..... |
| Hot running water at sink | ..... |
| Pump at sink | ..... |
| Bathroom | ..... |
| Power washer | ..... |
| Piano | ..... |
| Phonograph of any kind | ..... |
| | |

In the blank space against the name of each farm and home convenience, give the number of each found in your town-ship.

(a) A cow map may be made showing the number of milch cows, representing each cow by a small circle with a bar or cross in each circle to differentiate the breeds.

(b) A corn map will show the acreage of corn in the district, and might be made to include results of a census upon varieties.

(c) A soils map would show by colors or different shades of black, the location of the different types of soils, such as sand, clay, loam, etc.

In addition to these, maps could be made showing the wooded area in the districts, the amount of untilled land, the number of silos built, the sheep, swine or other livestock population of the district. In fact, the ingenuity of teacher and pupils will work out a great many interesting types of maps.

Any questions on the description of land or location of farms may be settled by the descriptions given in tax receipts that pupils may bring from home.

To verify the boundaries of the district, a visit should be made to the town clerk's office, where a map of the district should be on file.

Even if the teacher is perfectly acquainted with the whole district it will be better for her to have the pupils contribute information that they may have, or which they may get from their homes. As this information is brought in by the various pupils, it should be added to the map. The map will then be a result of the pupil's own work and investigation, and they will look upon it as their product.

As the teacher talks with the various patrons of the district and the members of the school board, she should find out for herself the facts regarding the various farms so as to check upon the work done by her students.

Keep an accurate record of information. Teachers should make record of facts accurately, when received and verified. This record will be embodied in the maps, and will also be kept on file for comparison with future surveys.

THE SURVEY A HISTORY OF THE DISTRICT

The social survey should provide a thorough, but not too extensive, general history of the entire district. Early features should be given prominence in a 500- to 1000-word chronicle of local events and interests.

Kinds of facts noted. The following are some of the questions that may be given by the teacher for the children to ask at their homes: Who were some of the first settlers in this community? When did they come? Where did they settle? What was the condition of the country at that time? Where was the first clearing made? What kind of buildings did the first settlers erect? Are any of those old buildings still standing? Where was the first schoolhouse built? What kind of building was it? Is it still in existence? What salary was paid the teachers? Tell of the first churches. From where did the people of this community come? Name the various countries or states represented, such as Norway, Germany, Ireland, New England, New York, etc. Where did the early settlers go to market? Where did they get flour? What kind of conveyance was used week-days? On Sunday?

How to get the facts. By questioning people, especially the old settlers, if any remain, by corresponding with persons who have moved away, by consulting old records of school boards, churches, town officers, or historical societies, these facts can be obtained.

HOW TO UTILIZE THE SURVEY IN THE SCHOOL

The rural study project. As soon as possible after the survey has been made in the districts of a township, and after the district summaries have been filled out, a meeting of the teachers of the township should be held. Each teacher will bring her district summary to the meeting.

Then each teacher will copy the district summaries of the other teachers so as to carry back these district summaries of the township to her own school.

Each pupil in the district should then make for himself a little booklet, which might be called "The Rural Study Project." This should finally be bound and covered so that it may be used daily, like a textbook.

It should contain a copy of all the district summaries of the township, footed up into a township summary. This booklet, under the title of "The Rural Study Project," will be the chief means of using the survey in the classes. The accompanying illustration shows how a page of the booklet looks.

Farmers' club program. It is quite evident that the local farmers' club will desire to use all the information obtained by

the survey. Many club programs would receive a great stimulus from discussion of the district crops and township crops for the year.

Exhibits. Maps showing the condition of the district with respect to crops, animals, fruits, and household conveniences, are always acceptable at school exhibitions, farmers' club meetings, community fairs, and county fairs. Township maps, likewise, may be made by some enterprising pupils for exhibits purposes, enabling the people of the district to compare one district with another. Exchange of exhibits among neighboring schools may be valuable.

HOW THE SURVEY MAY BE UTILIZED IN THE COUNTY

By the county superintendent. The county superintendent of schools by means of county maps showing all the school districts, can quickly display to backward districts how far they are behind the rest of the county. This will prove more effective than exhortation. In like manner, showing the county maps to those districts which have achieved progress will prove stimulating, like praise discreetly given.

By the county board. The county board will have many uses for the results obtained year by year in the school district surveys. An annual county crop census, animal census, acreage census, or machine census, will spread before the board a picture of the progress of the county.

By the county agricultural agent. It is difficult to think of an instrument more useful to the county agent than the annual county survey. He can enforce his plans with community after community by the county crop and animal statistics and maps.

By the county press. News, feature articles and editorials on all kinds of agricultural topics will be made available by the county survey. Guessing will be displaced by knowing.

4
Cull the Flock

J. G. HALPIN,
D. H. REED, J. B. HAYES



This hen laid
466 eggs in two years

AGRICULTURAL EXPERIMENT STATION OF
THE UNIVERSITY OF WISCONSIN

MADISON

KEEP THE LAYING HEN

CULL

1. Poor layers and all old hens.
2. Cripples, and hens with broken-down abdomens or frozen toes.
3. The sick, quiet, inactive hens that spend much time on the roost.
4. All "crow heads" with long, slim heads and beaks.
5. The large, coarse-headed hens with sunken eyes.
6. All very short, stubby hens with feathers extremely heavy for their breed.
7. All late-hatched immature pullets and those that are early hatched but much undersized.
8. All hens that molt before August 1.
9. The persistent sitter.
10. All hens with solid, fat abdomens.
11. All hens having bad habits (cannibals, feather-pullers, egg-eaters).
12. All cockerels not needed for breeding purposes.

KEEP

1. Strong, healthy, vigorous hens with short, neat heads and strong beaks.
2. The hens with long, deep, rectangular bodies and parallel top and bottom lines.
3. The hens with large, bright eyes, active appearance and short, well-worn toe nails.
4. The hens with dusty, worn feathers, especially worn tail feathers, but having a bright, healthy look.
5. The hens that molt late.
6. The noisy, happy, friendly hens.
7. The early risers and those late to roost.
8. The vigorous hens with the faded beaks and shanks.
9. The hens with the soft, pliable abdomens.
10. The hens with the thin pelvic bones spread wide apart.
11. The early-hatched, well-grown pullets.
12. Large, strong, active, quick maturing cockerels of desired variety type and high-producing mothers.

Cull the Flock

Every flock of hens is an egg factory. Like any other factory the flock can be given the best materials in the world to work on and still fail to produce enough to pay for running the plant. Good feed in sufficient variety is necessary for egg production, but the ability to manufacture eggs from feed must be there first.

Too much of the feed and the time that go to a flock in which even a fourth of the hens are naturally poor layers is wasted. One Dane County farmer culled his flock of 700 hens and sold 200 hens to the butcher, without decreasing the egg production of his flock. He says that the culling saved him \$2 a day on feed alone and made the work much easier as well.

The heavy layer can be told from the poor layer. Her ability to manufacture eggs is told by the shape of her body, her actions, the time of year in which she molts, the loss of yellow coloring matter in beak and shanks, and the size and softness of her abdomen. No one breed or strain of hens shows these characteristics all the way through, but the poor layer of any breed or strain betrays herself.

The hen shows her ability as an egg producer the first laying year. Production the first season is usually 15 to 30 per cent higher than in later seasons. Only hens whose first year's production is unusually high are worth keeping a second year. Old hens may pay their way just by producing meat for the table, but why have a flock working half-time to produce meat when it might as well work full time, producing both meat and eggs?

It pays to cull out the poor layers any time, to save the feed and labor they cost, but to make a profit on them it is best to cull in late summer or early fall, before the rush of spring chickens lowers the market price of old hens.

Shut up all the hens and pullets some evening. Count them and decide just how many can be readily kept during the coming year without crowding, for this is very likely to hurt egg production and increase the danger of disease. The next morn-

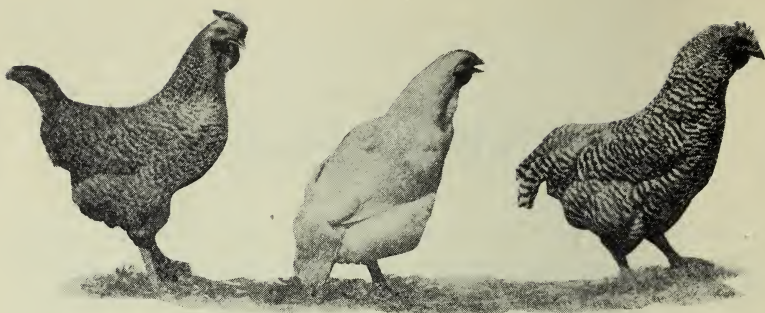


FIG. 1.—WEED OUT THE UNPROFITABLE HENS

The hen on the left has a rooster head and spurs; the middle hen has a broken-down abdomen due to over-feeding; the coarse hen on the right never laid an egg in her life.

ing the flock is ready to be culled. The best culling is done when the person doing the culling has closely studied his flock for most of the season and has marked especially good hens from time to time.

WHAT TO SELL WHEN CULLING

Cull out the hens and pullets that show they cannot become heavy producers. Put them in separate coops or poultry houses, and if they do not lay send them to the butcher. Begin by removing the cripples, including those with frozen feet, crooked backs, weak legs, badly twisted beaks or deformed toes. Such hens are weak and never have a chance to get enough feed to be good layers. They spoil the appearance of a flock and add to the cost of feeding.

Get rid of the hens with baggy abdomens hanging down over the rear end of short keel bones. Their abdomens have broken down from over-feeding and become large and fat, spoiling their egg production. The hens with baggy abdomens may continue to lay heavily for a time but when they once stop they seldom start again. The death rate, too, among such hens is very high.

The wedge-shaped hen with the heavy end of the wedge to the front is lacking in room to digest much food. Hens with small abdomens lack room to digest the large amount of food needed for heavy egg production.

Small, weak, inactive hens with long, slim heads and long beaks are greatly lacking in vigor and are very likely to be

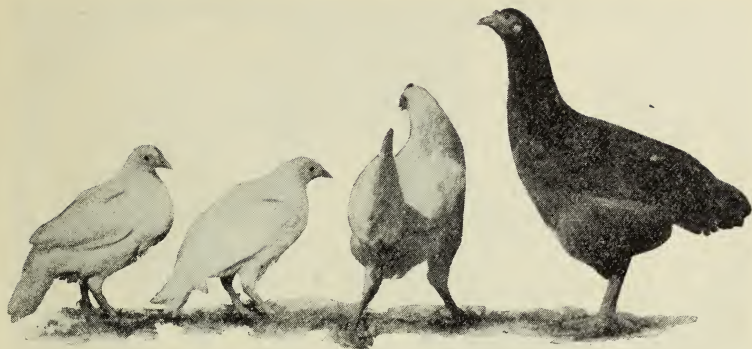


FIG. 2.—WEED OUT THE LATE HATCHED AND WEAK PULLETS

The two little chicks on the left were late hatched and poorly developed when the picture was taken in December; the pullet in the center has crippled legs and back; the pullet on the right has a crow head.

victims of disease and to spread contagion in the flock. Breeders report that such hens often lay heavily for a short time but they lack the strength and vigor necessary to stand up under continued egg production. Their chicks are likely to be weak and hard to raise.

On the other hand, the large coarse hen with the small sunken eye is undesirable. She is a beef-type hen, a big eater, and a poor layer except for a short time in the spring. The short-legged stubby hen is lacking in capacity. The hen with long, loose feathering showing lack of quality is usually a poor layer. Hens of these three types should be removed from the flock.

KEEP THE GOOD EGG-TYPE HEN

The good egg-type hen lays 150 or more eggs in one year. She is strong, vigorous, and capable of standing the heavy strain due to heavy egg production. Her head is neat, feminine, and clean, with no extra flesh. Her beak is short, strong, and slightly curved. The distance from the eye to the point of the beak is short, while the eye itself is large, bright, and prominent.

All good laying hens have long, broad, and deep rectangular bodies with parallel top and bottom lines. This shape of body gives room for the large organs needed to digest the amount of feed necessary to make large numbers of eggs. Their backs are broad and fairly long for the breed, with ample room for egg-yolk development. This ample room is necessary, as it takes

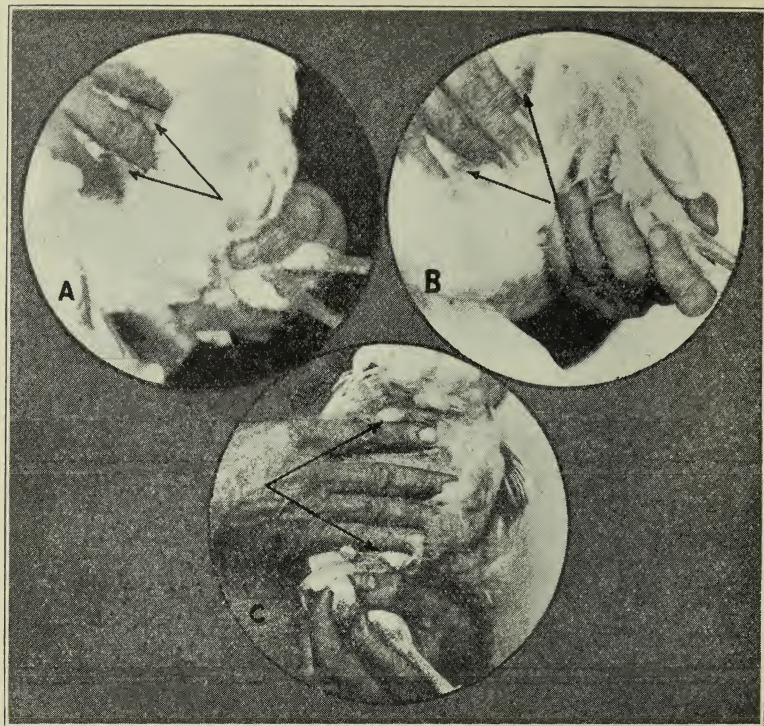


FIG. 3.—MEASURING ABDOMINAL CAPACITY

(A) When the pelvic bones are one finger apart the hen is not in laying condition. (B) Three or more fingers can go between the bones in the heavy-laying hen. (C) Plenty of depth in the abdomen means an increased power to lay.

14 days or longer for an egg yolk to develop, and the heavy layer has eight or more of these egg yolks developing at the same time. Good producers lay two to four days, then miss one day.

ACTIONS OF THE LAYING HEN

The good layer is a very busy hen. She rises early and goes to roost late, for she is too busy and vigorous to waste time on the roost during daylight hours. One poultry owner culled his flock quite accurately by selling the hens that were the last one third to leave the roost on a spring morning.

The heavy layer is a big eater and is always busy scratching and searching for more feed in greater variety. She must work if she is to find the feed necessary to lay many eggs. She is a

happy hen and is often heard singing when hustling about the poultry yard. Hens that lay heavily are seldom much afraid of those who feed them and are usually very easily tamed.

The timid watchful hens that stay at the outskirts of the flock fail to get their share of the feed and so fall down on egg production. The inactive, dull, lazy hens that spend much time on the roost are poor layers and pay best when sent to the butcher.

HEAVY LAYERS MOLT LATE

Repeated tests show that the hens that begin to molt before August 1 are usually drones, for they take a long time to molt and do not often begin to lay again for four or five months. Then hens that are so busy laying eggs that they have to put off molting until after the middle of September can be safely kept, as they molt quickly and begin laying again as soon as they are through molting. One hen at the University of Wisconsin with a two-year record of 464 eggs has laid every month for 24 consecutive months, beginning in November, 1917.

All hens nearly naked in October and November and those that still have their old feathers are the hens that have been profitable layers during the year, and they should be kept for breeding. This is a good test for selecting the heavy layers. Good hens fed an insufficient ration that does not let them lay eggs may molt during the summer. This shows that while early molting is a sure sign of poor production it may not always be a sign of poor-producing hens.

LAYING HENS HAVE WIDE-SPRUNG PELVIC BONES

One good way to tell the laying hen from the non-layer is to examine the position of the pelvic bones situated on each side and slightly below the vent. These are two slightly curved bones, similar to the pin bones in the cow. The pelvic bones of the non-layer are close together. It is impossible for a man to put more than one finger between the points, and they seem to be very closely bound to each other by cartilage-like bands.

When the pullet or hen is about to begin laying, her pelvic bones spread farther apart and the abdomen between the points becomes very soft and pliable. The heavier the hen is laying

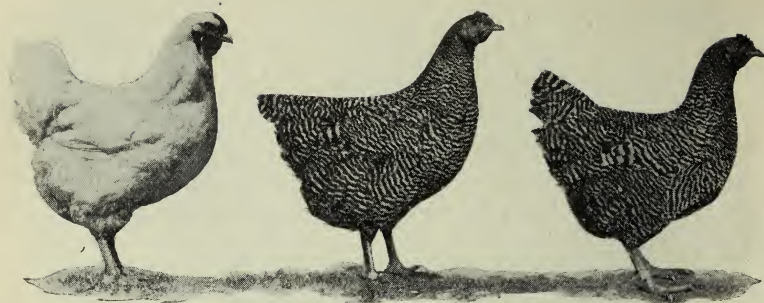


FIG. 4.—SAVE THE GOOD LAYING HENS

It pays to select the best laying hens for a breeding pen instead of hatching chicks from the entire flock.

and the larger the eggs she lays, the greater will be the distance between these pelvic bones. In a very heavy-laying hen three or more fingers can be placed between the tips of the bones. The hen that is laying not quite so heavily will have pelvic bones about two fingers apart. With old hens the bones do not always close up when they stop laying but remain wide apart. Such hens, however, can be told by their solid abdomens and the large amount of gristle and meat at the end of the pelvic bones.

DISTANCE BETWEEN PELVIC AND KEEL BONES INDICATES FEED CAPACITY

The size of the abdomen measured in finger widths between the pelvic bones and the keel bone (rear end of the breast bone) is a fairly good sign of the hen's capacity for feed. This capacity changes with the condition of the hen and is usually one finger less in the sitting hen than in the laying hen. The abdomen of the laying hen of a small breed should measure at least three fingers and at least four fingers in a hen of the larger breeds. Exceptionally high producers usually have four- or five-finger abdomens, irrespective of breed.

QUALITY OF ABDOMEN DENOTES EGG CAPACITY

The abdomen of the good layer is soft and pliable, with a smooth skin. When the hen is laying heavily her abdomen is large and full but extremely soft, similar to a good cow's udder

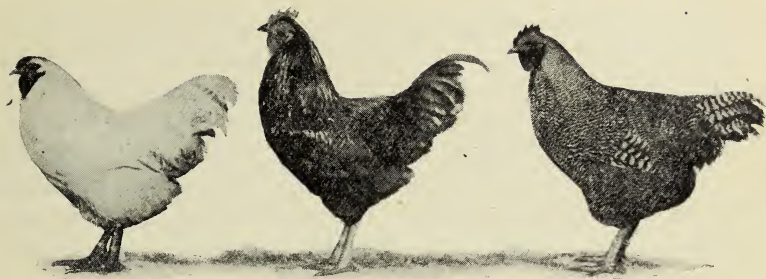


FIG. 5.—SAVE THE SONS OF GOOD LAYING HENS

The male is half the flock. Wisconsin farmers are increasing the average egg production of their flocks by breeding to sons of high-producing hens.

when partly milked. If she stops laying and becomes broody, her abdomen shrinks rapidly and feels thin and skinny between the pelvic and keel bones.

Hens with coarse meaty abdomens might just as well be sold for they will never be high producers except for one or two months in the spring of the year. Such hens usually have large, coarse bodies with coarse heads and sunken eyes. They develop slowly and do not lay until nine or ten months of age.

LOSS OF YELLOW COLOR HELPS DISTINGUISH BEST LAYERS

Heavy layers of the yellow-skinned breeds appear faded when laying heavily. The yellow color gradually disappears from vent, eyerings, beak and shanks in the order given. The beak is nearly white after one month's heavy production while the shanks do not lose all the yellow color till after three months' work. The yellow color returns to the vent, eyerings, beak and shanks in the same order that it fades but more quickly if the hen is properly fed.

Sick hens and hens in dry yards fed rations containing little yellow corn and green stuff are likely to have faded beaks and shanks even when they are not laying. This has been proved by a number of experiments carried on at the Wisconsin Experiment Station.

When culling a flock of Plymouth Rocks, Wyandottes, Rhode Island Reds, Leghorns or other yellow-skinned breeds it is a good plan to look first at the color of the beak and shanks of the male bird. He will be a good standard for the color of the non-layer. Catch the hens with deep yellow beaks and shanks

and if they have solid, meaty abdomens with thick pelvic bones tied closely together, cull them out. They have not been laying for two or more months and are not going to lay in the near future. Such hens can be easily told from the hens that have but recently begun to lay for the beak of the laying hen is faded for part of its length next the head while her abdomen is somewhat soft and pliable. Her pelvic bones are two or more finger widths apart and the cord-like connection between them has disappeared.

The good laying hen that has been laying heavily for one month has a faded beak but quite yellow legs. Her abdomen is soft and very pliable while her pelvic bones are three fingers apart and her vent large and moist. The poor producer's abdomen is coarse in texture with pelvic bones spread two fingers apart.

The hen that has been a high producer for three or four months and is going to continue to produce heavily has faded beak and shanks. She has an extremely large, soft abdomen and vent, with a loose skin of fine texture and thin, easily bent, nearly straight, wide-spread pelvic bones. Her feathers look thin, worn and faded, and dust seems to stick to them very easily.

The lazy boarder hen producing not over 10 or 12 eggs a month has a dull yellow beak and legs, even when she has been laying for several months. Her abdomen is likely to be small, or, if large, it is coarse and rough in texture, while her pelvic bones are likely to be badly incurved and stiff.

The hen that has been sitting for a few days or has quit laying for some other reason shows a yellow color at the edges of her beak. Her abdomen is likely to feel empty, as she will not have eaten much for a few days, and her pelvic bones are spread less than two fingers apart. At the end of three weeks the yellow color will have only faintly returned there and the abdomen will begin to feel meaty unless the hen is soon to begin laying.

The hen that is not molting and has had two or more months' rest will have regained all her yellow color. Her abdomen is likely to have a solid meaty feel the same as that of the typical non-producer. The hen with the brood of chicks regains all her color but is not likely to have a fat, meaty abdomen unless after leaving her chicks she takes quite a rest before beginning to lay.

By carefully following instructions, one can, with a little practice, select the hens that have been heavy layers and are likely to be heavy layers in the future. One can also dispose of those hens that have been nothing but a big expense, laying too few eggs to pay for their feed. Non-layers make fine Sunday dinners.

BREED FOR EGG PRODUCTION

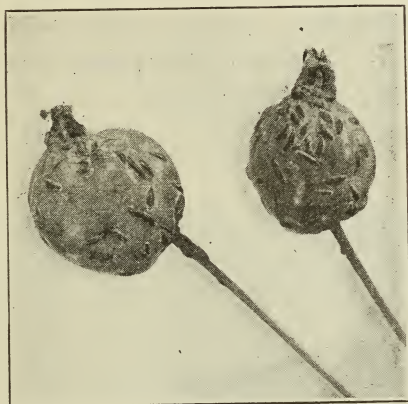
Go over the entire flock at least one a year to select the best hens and keep them for breeding purposes. Get cockerels from a heavy-laying strain, as in this way the production of the flock can be increased. That it pays to cull and to breed from sons of known high-producing hens has been demonstrated by the record of one of the University flocks of White Leghorns. In 1914 the average production of one strain was 112 eggs, but by culling and breeding to sons of known high-producing hens the average has been raised to 185 eggs. This is an increase of 65 per cent, an added income of \$3 a hen each year. The result is that no White Leghorn hens are kept for breeding at the University unless they lay at least 200 eggs during their first 12 months of laying.

Of course, it is understood that no matter how good the laying strain from which the hens are raised they should be hatched early enough to mature fully before cold weather comes. This means they should be at least six months old by November 1st if they are to be heavy producers during the winter. Very late-hatched chicks should be fattened and sold as soon as possible, for such chicks very seldom make profitable layers.

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Fight Oyster Shell Scale

Charles L. Fluke, Jr.



UNFIT FOR MARKET OR TABLE

Fruit that becomes so infested with oyster-shell scale as these two immature apples are, will never be fit to sell or use.

The oyster-shell scale,* which probably occurs in every apple orchard in Wisconsin, can be easily checked if the proper spray is used at the right time.

It causes more injury to fruit trees than most farmers realize, many regarding it as a harmless insect which needs no special attention. The pest is so easily checked that every orchard could be reasonably free from the scales without expenditure of much time or effort.

The oyster-shell scale has spread throughout the country until it can be found in the orchards of practically every state in the union, and in most fruit sections of Canada. It is especially harmful in the Great Lakes region, where it is often mistaken for the San Jose scale.

WHAT THE OYSTER-SHELL SCALE LOOKS LIKE

The oyster-shell scale is readily distinguished from other scales attacking apples by its rather peculiar shape, that of an oyster shell, and by its color, which closely resembles the dark brown of the bark of apple trees. For this reason it is difficult to detect the pest when only a few scales are present.

The female scale is about one-eighth of an inch long and is larger than the scale covering the body of the male. The smaller end of the female scale consists of the moltings or cast off skins

**Lepidosaphes ulmi* L.

of the growing insect while the larger end, which is finely ribbed, is composed of a scaly material secreted from the body of the insect underneath. The male scale is very seldom seen on fruit trees. The old lifeless scales adhere to the bark for several years, and since new scales are yearly being formed the larger limbs and branches often become so encrusted that very little of the bark itself is visible.

IMPORTANT THINGS TO REMEMBER ABOUT THE OYSTER-SHELL SCALE

1. It is easily checked if proper materials are used and applied at the right time.
2. Use liquid lime sulfur, 1 gallon, to 12 gallons of water.
3. Apply spray while the trees are dormant.
4. Cover branches and limbs thoroughly, spraying from all sides.
5. Repeat every two or three years.
6. Control measures used against the oyster-shell scale are also sufficient to check the ravages of the San Jose scale.

NATURE OF THE SHELL SCALE INJURY

Scale insects belong to a group which secure their food by means of sucking mouth parts; thus the sap of the plant is sucked out, taking from the tree the necessary amount of nourishment to grow properly and produce good fruit. The oyster-shell scale seldom causes the death of the host in its entirety; however, in severe infestations complete limbs and twigs are often killed, which stunts and retards the growth and development of the tree to such an extent that it is a hindrance rather than an asset to the orchard.

ALSO FEEDS UPON MANY OTHER PLANTS

Although usually found on apple, maple, horse-chestnut, poplar, willow, and lilac, the oyster-shell scale has a very wide range of food plants, having been recorded on more than 100 species of shrubs and trees. Besides the hosts mentioned above it occurs on the following more or less important plants: basswood, box elder, cherry, currants, grape, pear, plum and rugosa rose.

HOW THE OYSTER-SHELL SCALE LIVES

1. **How the insect passes the winter.** Any time during the dormant season (September to the following May) if one will take a pin or knife and carefully turn over a few of the scales, formed the preceding summer, one will find underneath, at the smaller end, the

ld, dried-up female, and at the other end the small white glistening eggs (see figure). The insect passes the winter in this stage, the adults dying soon after eggs are produced in the fall.

2. Time of hatching of eggs. In 1917 the overwintering eggs began hatching at Madison June 8-12 and in 1918 from May 25-28. This variation in the time of hatching is caused by the earliness or lateness of the season. Southern Wisconsin will be 3 or 4 days earlier and the northern and lakeshore region a week to 10 days later. Soon after hatching the pale yellow young crawl from under the parent scales and seek a place on the bark, leaves, or fruit to insert their beaks which are long and thread-like. From this position, the females never move but continue to grow and secrete their scale-like covering. After the first molt they lose their legs and antennae, becoming small grub-like creatures. As soon as the males shed their skins the second time, they develop wings and emerge from under the scales to seek their



THE EGGS OVER-WINTER UNDER THE DARK BROWN SCALES
Scales the shape of an oyster shell are found on the bark of many trees. From September to May the eggs can be found by carefully turning over a few scales. This picture is considerably enlarged.

mates. The females continue to feed and become full grown in August, after which time egg-laying begins. When this is completed, the adult dies.

HOW TO FIGHT THE OYSTER-SHELL SCALE

Material to use. Lime sulfur is the standard spray for the control of scales infesting apple trees. It should be used at the rate of 1 gallon of lime sulfur to 12 gallons of water.

Time and method of applying spray. The strength of lime sulfur as recommended above is for dormant trees only, to be applied late in the fall or early in the spring before the leaves appear. It is best applied just as the buds are swelling and before any foliage appears. The spray must actually come into contact with the scales to control them, therefore a thorough application is necessary. Any good pump which will give at least 100 pounds pressure to insure a fine misty spray will perform the work well enough for satisfactory results. If the work is well done it will be unnecessary to repeat this spray every year, every two or three years being sufficient to hold the scales in check.

THE SAN JOSE SCALE IS CONTROLLED AT THE SAME TIME

Lime sulfur used at the rate given above and applied when the trees are dormant is the best control of the San Jose scale. Both insects are killed with the same spray.

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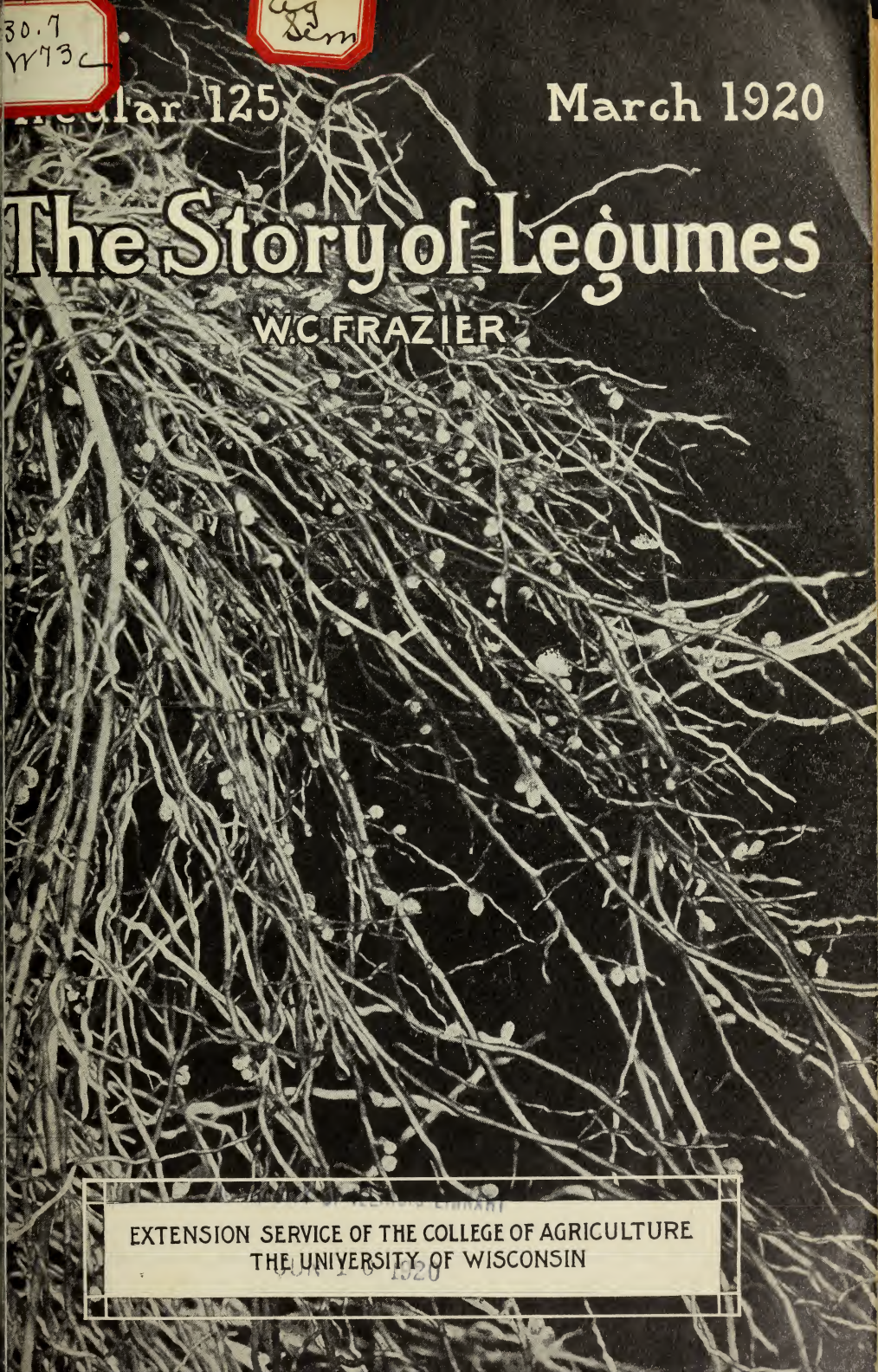
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March 1920

The Story of Legumes

W.C. FRAZIER



EXTENSION SERVICE OF THE COLLEGE OF AGRICULTURE
THE UNIVERSITY OF WISCONSIN

MAR 16 1920

The Story of Legumes

In the air above every field there are tons of nitrogen. It is in a form, however, that ordinary plants cannot use.

Fortunately this expensive fertilizer can be obtained from the air by a comparatively simple and inexpensive method. If legume plants and legume bacteria are grown together, nitrogen is taken from the air by the bacteria and used by the plants.

Without the bacteria, the legume plants act like other plants, for they use large amounts of nitrogen from the soil, robbing the soil to that extent.

Legume plants are so named because the fruit of all is a pod or legume. Legume plants include not only the clovers, vetches, peas, beans, and other common cultivated crops, but also a large number of weeds, bushes, and trees ranging from the beggarweed to the locust tree.

GROW IN EVERY CLIMATE

Legumes are found all over the world, wherever there are other flowering plants, from the tropics to the arctic regions. They are more numerous in the warmer climates. Most of the legumes that we cultivate came from the Old World, except the garden bean and lima bean. There are, however, a number of wild legumes native to the Americas; according to one writer more than 3800 species have been found.

In Wisconsin 82 species of wild legumes have been identified. These include the wild indigo, tick trefoil, wild lupine, black medic or nonesuch, wild bean, the vetchlings, lead plant, locust, partridge pea, rattlebox, hog peanut, Indian potato, milk vetch, ground plum, wild senna, honey, common and clammy locust, wild licorice, Kentucky coffee tree, everlasting pea, beach pea,

bush, bur, sweet, prairie, yellow or hop, low hop and white clover, yellow melilot, pomme blanche, and goat's rue or catgut.

At Rothamsted, England, experiments upon wild grass land, mown for hay every year for 57 years, show that legumes make up about 9 per cent of the herbage of the unfertilized plots and about 25 per cent of the plots receiving mineral fertilizer but no nitrogen.

ALL LEGUMES ARE SIMILAR

There are certain points of similarity among all the legume plants. In all the fruit is a pod or legume. Their leaves alternate on the stem and are rarely simple, being usually composed of leaflets arranged in pairs along a common axis, with or without a leaflet at the end. This arrangement may be reduced to but three leaflets or even to the single leaflet at the end. Under normal conditions the roots have on them wart-like swellings called nodules. These may be readily seen if the legume plant is carefully dug up and the roots washed free from dirt.

HOW LEGUMES AND NON-LEGUMES DIFFER

There are two main differences between legumes and non-legumes. Legumes are much richer in nitrogen or tissue-building substances than most non-legumes, making most of those of succulent character especially valuable for feed. The high carbohydrate content of the non-legumes, on the other hand, makes them important as sources of energy.

The great value of the legumes is due not only to their high protein content, but also to their richness in lime, which is required in large amounts by growing animals and those which are pregnant or giving milk. The legumes, then, supplement the grains and grasses in the ration, providing larger amounts of proteins and lime. This table gives a comparison of the digestible nutrients and fertilizing constituents in several legumes and non-legumes:

AVERAGE FERTILIZING CONSTITUENTS AND DIGESTIBLE NUTRIENTS TO THE
TON

Kind of Forage	Fertilizing Constituents in One Ton			Digestible Nutrients in One Ton			
	Nitrogen	Phos- phoric acid P ₂ O ₅	Potash K ₂ O	Crude protein	Carbo- hydrates	Fat	Total
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Alfalfa hay	47.6	10.8	44.6	212.0	780.0	18.0	1,032.0
Red clover hay....	41.0	7.8	32.6	152.0	786.0	36.0	1,018.0
Soybean hay	51.2	13.6	46.6	234.0	784.0	24.0	1,072.0
Field peas, hay...	48.4	13.4	24.8	244.0	802.0	38.0	1,132.0
Corn fodder	21.4	6.6	17.8	60.0	946.0	30.0	1,074.0
Timothy hay	19.8	6.2	27.2	60.0	856.0	24.0	990.0
Kentucky blue grass hay	26.6	10.8	42.0	94.0	870.0	30.0	1,032.0
Oat hay	26.8	16.0	65.4	90.0	762.0	34.0	928.0

The non-legume draws all of its nitrogen from the soil, while the legume, under proper conditions, gets a good part of its nitrogen from the air. The reason for this difference is that in the nodules on the legume roots the legume bacteria "fix" or gather the nitrogen ready for use.

All good farmers know the need of keeping their soil supplied with sufficient amounts of the necessary elements and that the three most often lacking are phosphorus, potassium, and nitrogen. Here, then, are plants which provide this expensive fertilizer, nitrogen, and in addition are useful forage crops.

If the legume is turned under as a green manure, this gain in nitrogen is all added to the soil; if the legume is fed, part of the nitrogen comes back in the manure; but if the legume is cut off and sold there will be a loss in nitrogen fertility, although some of the nitrogen is left in the roots. The taking of nitrogen from the air by the legume bacteria results in a smaller loss of nitrogen from the soil than if there had been no fixation. If legumes are bought and fed there will, on the other hand, be a gain in the nitrogen on the farm.

All of this gain in nitrogen takes place, however, only under proper conditions, that is, conditions which favor the growth of these wart-like nodules on the legume roots. Without these nodules the legume, like the non-legume, takes all of its nitrogen



FIG. 1. GARDEN PEAS GROWN ON POOR SANDY SOIL AT HOLMEN
Plants on the left were uninoculated. Plants on the right were inoculated.

from the soil. It might now be called a soil-robber, for it needs and takes more nitrogen from the soil than does a non-legume, without helping out the supply. In a soil poor in nitrogen there are worse results: the legume, needing plenty of nitrogen on account of its high protein content, grows poorly or not at all, or if it grows uses up what little available nitrogen there is.

NODULES ON THE ROOTS OF LEGUMES

If there is to be a gain in nitrogen through the legume there must be nodules on the roots, and to produce these nodules there must be the right kind of bacteria. The legume bacteria are very particular about what plant they will choose for their home. Bacteria that live in the alfalfa nodules will not form nodules on the roots of the true clovers, beans, peas, or soybeans, but will produce nodules on the roots of sweet clover or certain wild legumes. The bacteria from the soybean nodule do not produce nodules on any other of our common legume plants. In general, the bacteria from one legume will produce nodules only on certain closely related plants.

SOME LEGUMES "CROSS-INOCULATE"

Different legumes usually require different bacteria, although there are many exceptions. The legumes may be divided into separate groups within which the bacteria from one legume will produce nodules on the roots of the other legumes in the group, or "cross-inoculate." The following list gathers the common legume plants into groups that cross-inoculate:

1. To inoculate *red clover*, use the bacteria from red clover, mammoth red, alsike, crimson, Egyptian or white clover.

2. To inoculate *alfalfa*, use the bacteria from alfalfa, white sweet clover, yellow sweet clover, bur clover, yellow trefoil, or fenugreek.

3. To inoculate *garden pea*, use the bacteria from garden pea, field pea, hairy vetch, spring vetch, wild vetch, broad bean, lentil, sweet pea, or perennial pea.

4. To inoculate *cowpea*, use the bacteria from cowpea, partridge pea, peanut, Japanese clover, velvet bean, lima bean, wild indigo, or tick trefoil.



FIG. 2. SWEET CLOVER GROWN NEAR ANTIGO

Plants on the left were uninoculated. Plants on the right were inoculated.

5. To inoculate *garden bean*, use the bacteria from garden, field, navy, kidney, or scarlet runner bean.

6. To inoculate *lupine*, use the bacteria from lupine, serradella or wild lupine.

7. To inoculate *soybean*, use only the bacteria from the soybean.

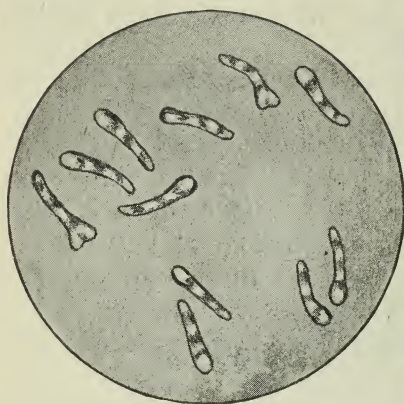
The bacteria produce characteristically shaped nodules on different legumes. The nodules on the bean plant are usually round, on the clover oval, on alfalfa club-shaped and often grouped in finger-like bunches, and on the soybean large and round. They may be scattered out over the root system as in clover and alfalfa, or grouped along or near the tap root as in the cowpea or soybean; they may be small as in clover or large as in the soybean.

FALSE NODULES RESEMBLE TRUE NODULES

Various kinds of nodular growths or galls may occur on the roots of plants. The nodules produced by the nitrogen-fixing bacteria may be termed true nodules and the others false. Of the latter, the galls caused by parasitic eel worms or nematodes so closely resemble true nodules that they may be confused with them. The false nodule or nematode gall is marked by a swelling or enlargement of the root rather than a growth on one side. In Wisconsin these occur commonly on greenhouse plants, but only rarely out of doors. The disease known as crown gall causes a larger swelling, usually at or near the crown, and usually on woody nursery stock, and should cause no confusion.

THE LEGUME AND BACTERIA FORM PARTNERSHIP

If one of the nodules from a legume is cut open and part of the inside examined with a high-powered microscope, the legume bacteria can be seen as numerous, minute, rod-like bodies, or perhaps X- or Y-shaped bodies. Each nodule contains millions of these little organisms. Legume bacteria may be in the soil or may be introduced by the farmer with the legume seed or with soil upon which legumes have been grown. When the legume bacteria come in contact with the fine root or root hairs of their kind of plant, they enter and make the root cover their

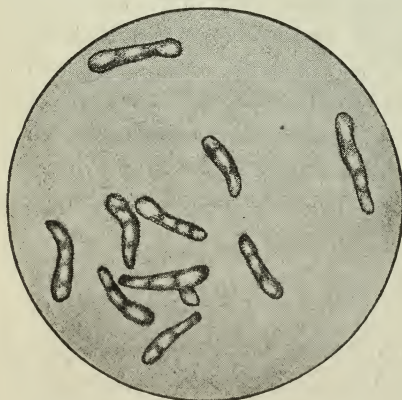


Bacteria

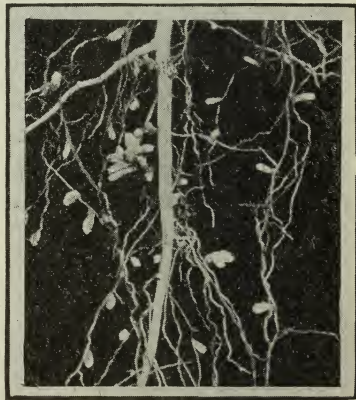


Nodules

RED CLOVER



Bacteria

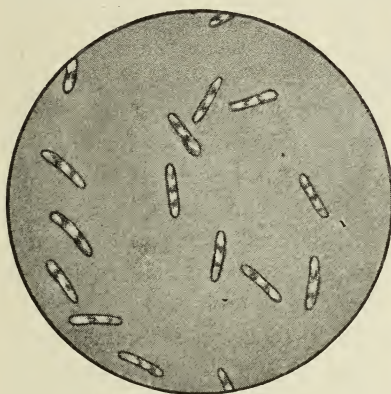


Nodules

ALFALFA

FIG. 3. NODULE BACTERIA OF DIFFER

The area covered by each organism in the picture of bac

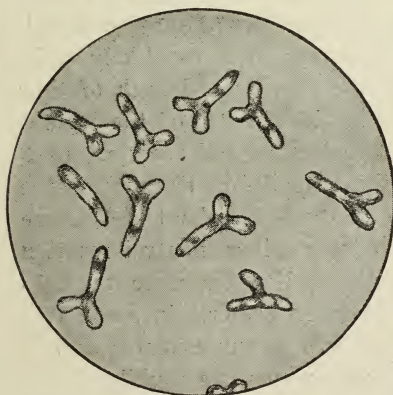


Bacteria

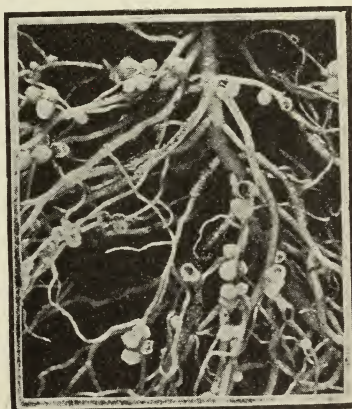


Nodules

SOYBEAN



Bacteria



Nodules

PEA

LEGUMES VARY IN SIZE AND SHAPE

s equal to that covered by 2,250,000 of the actual bacteria.

home. Here they grow and multiply rapidly and soon push and swell out the covering of the root to form the nodules.

The bacteria and the plant now work in partnership to the benefit of both. The bacteria get food from the plant-juice and a home in the nodules. They repay the plant by giving it nitrogen combined so that the plant can use it as food. They obtain this nitrogen from the air, a thing which the plant is unable to do. About the time the legume begins to form seed, the nodules cease to grow, lose their plump appearance, begin to shrink, and eventually decay; and the bacteria are returned again to the soil. Here they may remain for a considerable time ready to enter another legume and repeat their work.

If the bacteria are to enter the roots of the legume, form nodules, and fix nitrogen, they must be at hand when the roots start to develop. The act of introducing the legume bacteria so that they can come in contact with the roots of the legume, enter the roots, and form nodules, is commonly called inoculation.

WHEN INOCULATION IS UNNECESSARY

Inoculation is not always necessary. Legumes such as red clover, alsike clover, and other true clovers, that have been grown in a locality for many years, generally produce an abundance of nodules without inoculation, for there are likely to be plenty of the legume bacteria in the soil. The length of time that they will persist in the soil in the absence of the legume plant will vary with the kind of bacterium, soil reaction, food, temperature, and moisture. If these conditions are proper, the nodule-forming bacteria may live in the soil without the legume for many years. In a fertile silt loam soil of neutral reaction soybean bacteria have been known to live for more than 18 years. As a rule, the number of legume bacteria in a soil free of legumes decreases rapidly after two to three years; and if the soil is acid the bacteria disappear even more rapidly.

Some writers have given the idea that inoculation of a field is accomplished if manure from animals fed with the legume is scattered over the field. Legume bacteria are killed in the digestive tract of farm animals. Small particles of soil and bacteria may be carried with the hay and thus become mixed with the manure. Such inoculation may be effective if the legume has been well inoculated; the inoculation may, however, be too light, making further inoculation necessary.

WHEN INOCULATION IS ADVISABLE

If a legume has never been grown on the soil or has not been grown for a long period of time, it will probably be necessary to inoculate. In certain localities in Wisconsin it has been found that the nodule bacteria of alfalfa, beans, peas, soybeans, and vetch may be absent. Then, too, legumes may show a few scattered nodules but present a weak sickly appearance. If the leguminous crop does show a few nodules on scattered plants, it will be advisable to inoculate the seed at the next planting in order to secure good nodule growth on all of the plants. Unless the legume bacteria are transferred by means of water, wind, or animals they spread very slowly in the soil. It has been found that when inoculated and uninoculated soybeans were sown in alternate rows two feet apart, the uninoculated plants rarely showed any nodules.

METHODS OF INOCULATION

There are two common methods of inoculation: by transfer of soil from a well inoculated field to the new field, or by the pure culture method.

Soil transfer method. In the soil transfer method soil is taken from a field where the desired legume has been successfully grown with a good production of nodules. The soil is removed to a depth of from four to six inches and broadcasted on the field to be planted with the legume. From 300 to 500 pounds of soil should be used to inoculate one acre. This method of inoculation is usually effective, but has several disadvantages: (1) it is not always possible to secure soil which contains the proper bacteria; (2) if the soil has to be hauled from a distance, much expense and labor are involved, especially where there are many acres to be inoculated; and (3) weed seeds, diseases, and insects may be in the soil and may be spread in this way.

Another method of using the soil is to moisten the legume seeds with glue and coat them with a pulverized soil containing the proper bacteria. It is recommended that one pound of furniture glue be used to one gallon of water. After the seeds are coated with glue and soil, they should be shoveled over, screened, and planted as soon as possible.

Pure culture method. If we could pick out these legume bacteria and place them so they would be on hand when their

special kind of legume plant began to grow and produce roots, we would be more certain of having nodules on the roots and nitrogen fixation from the air. This is what is done in the pure culture method of inoculation. It has been found possible to pick some of these bacteria from the nodules on the legume plant, separating them from all other kinds of bacteria, to grow them in the laboratory on special kinds of food, and have them increase rapidly in number up to billions on each ounce of food.

This one kind of legume bacterium, separated and grown by itself, is called a "pure culture." These pure cultures may be sent out in liquid form, on vegetable jelly, or in sterilized soil. To distribute the bacteria, the pure culture is shaken up with water; this mixture of water and bacteria is sprinkled over the seeds which are stirred until each seed is moistened. By this method the bacteria are brought into contact with the seeds and are carried with them into the soil. When the seeds germinate and form small roots, some of the bacteria come in contact with the root hairs, gain an entrance, and produce nodules.

The advantages of the pure culture method as compared with the transfer of soil are: (1) that it is easier and simpler to use; (2) it is less expensive when a reasonable price is paid for the cultures; (3) there is no danger of the spread of pests or diseases.

FACTORS INFLUENCING INOCULATION

The results of inoculation will vary with the soil, the kind of legume and the methods of cultivation. Inoculation will not remedy deficiencies in plant food other than nitrogen, nor will it remedy poor drainage, incorrect reaction, or poor preparation and care of the land. The land must be plowed and cultivated and seeded as carefully as usual.

The presence of the necessary fertilizer elements is essential, particularly of available phosphorus and potassium. These aid the growth of both the legume and its bacteria. Well-inoculated plants not only take a good portion of their nitrogen from the air, but also possess the power of absorbing a greater amount of potassium and phosphorus salts. The presence of larger amounts of available nitrogen in the soil will reduce to a great extent the amount of nitrogen taken from the air for the plants' use, but the presence of large amounts of unavailable nitrogen, as in

certain peat soils, will probably result in no decrease in nitrogen fixation.

The presence of large amounts of soluble nitrates in the soil seems to hinder the formation of nodules on legume roots, but does not harm the legume bacteria. In most soils, however, nitrates do not occur in amounts great enough to prohibit nodule formation. The presence of calcium or magnesium carbonates generally increases nodule production.

The kind of legume chosen must be that best fitted to the soil



FIG. 4. SOYBEANS ON SANDY SOIL NEAR PRINCETON

The soybeans on the left were treated with pure culture of soybean bacteria.

and climate of that part of the state. The soil reaction that is best for the leguminous crop is, in general, best for the respective legume bacterium. Alfalfa does poorly in a very acid or "sour" soil and requires a neutral soil for best growth; likewise the bacteria that produce the nodules on alfalfa do the best on a neutral soil and will not persist long without the alfalfa plant in an acid soil. On the other hand, the lupine bacteria, like the lupine plant, grow well on an acid soil.

RESULTS OF INOCULATION

The great benefit to be derived from the inoculation of legumes is the gain in nitrogen which the bacteria in the nodules take from the air. The difference between inoculated and uninoculated fields may or may not be evident to the eye. In a soil

poor in available nitrogen the difference will show in larger, greener plants in the inoculated field. A comparison of the root systems will show that the inoculated plants would leave much larger roots in the soil, an important fact on account of their high nitrogen content. On a rich soil, however, there may be little outward difference between inoculated and uninoculated plants. It must be noted, however, that the uninoculated plant has taken all of its nitrogen from the soil, while the inoculated plant may have taken as high as two-thirds of its nitrogen from the air. It has been found that on an average about 50 to 100 pounds of nitrogen an acre is fixed by a well-inoculated crop. This amount would vary a good deal with the soil, legume, and other conditions. Some investigators report gains of as high as 300 to 400 pounds under exceptional conditions. It has been found, too, that inoculated plants have a higher protein content than uninoculated ones and hence have a greater feeding value. The important fact to remember is that inoculation plays a big part in the conservation of nitrogen in the soil.

GROWTH OF LEGUME WITH NON-LEGUME

The work that has been done on the growing of legumes and non-legumes together seems to indicate that some benefit may result to either or both. Some investigators claim that the non-legume is benefited by a gain in nitrogen furnished through the legume. Others say that the legume, too, gains in nitrogen and protein content on account of the presence of the non-legume. It is highly probable that the growth of legumes and non-legumes together on fertile soil, for example, peas and oats, causes the legume to fix larger amounts of nitrogen than if grown alone. In the case of peas, the oats would limit the supply of soluble nitrogen and thus force the peas to secure nitrogen from the air.

BUY ONLY RELIABLE CULTURES

There are at present many commercial cultures of legume bacteria on the market. Some firms make extravagant claims for their bacteria, others are moderate. Tests conducted at various experiment stations have shown many of the cultures to be pure and capable of producing inoculation. In buying



FIG. 5. SOYBEAN PLANTS UNINOCULATED COMPARED WITH PLANTS INOCULATED

Ten soybean plants from the uninoculated plot of the field at Princeton compared with ten plants from the inoculated plot demonstrate the value of inoculation.

commercial cultures a reliable firm should be patronized, preferably one giving a positive guarantee with the cultures.

A so-called "All Crops" soil inoculum, supposed to contain "fertilizing bacteria," has appeared on the market. After work on this inoculum the Maryland Agricultural Experiment Station has issued this warning: "the inoculation of soils with nitrogen-fixing bacteria, other than those producing nodules on the roots of legumes, is extremely questionable; and the purchase of such material should be made only under a written guarantee of results."

PURE CULTURES FROM THIS COLLEGE

In order that the farmers of Wisconsin may secure fresh cultures of the kind of bacteria that will produce nodules on the legume they are to sow, the College of Agriculture will supply cultures of the different strains at the cost of materials. The bacteria are grown and sent to the farmer in bottles. One bottle is sufficient for each of the following amounts of seed:

- 20 pounds of alfalfa or sweet clover
- 20 pounds of red, mammoth, or alsike clover
- 30 pounds of soybeans or field beans
- 60 pounds of garden peas, field peas, or cowpeas
- 30 pounds of vetch

HOW TO APPLY FOR CULTURES

In order that the culture may reach the farmer at such a time as not to delay seeding, the application should be forwarded to the Department of Agricultural Bacteriology, College of Agriculture, Madison, Wisconsin, **at least 10 days** before the time of planting. The application should state the kind of crop and the number of pounds of seed to be sown. If less seed than the amount given above is to be sown, one bottle should be ordered.

The cultures are sent postpaid. The price (1920) is 25 cents a bottle. In order to avoid the expense of bookkeeping and of postage, it is desired that the money order, check, stamps, or cash accompany the order. If a request for cultures is received without the remittance, the cultures will be sent C. O. D. by parcels post. The additional cost, if the cultures are sent

C. O. D. by parcels post, will be 10 cents for the package irrespective of size. This charge of 10 cents is made by the post office department to cover the cost of collecting the money.

HOW TO INOCULATE

The pure cultures sent out by the College of Agriculture are on vegetable jelly in a bottle. The following is the procedure in inoculating the seed:

The culture bottle containing the bacteria is filled about two-thirds full of clean, cool water and shaken vigorously. The shaking removes the bacteria from the surface of the jelly. The liquid contents of the bottle are poured over the seed, using just enough liquid to moisten the seeds. If there is not enough liquid, refill the bottle with water one or more times. If the seeds are small, like alfalfa or clover seeds, a piece of gauze should be fitted over the mouth of the bottle before pouring, using a rubber band to keep it in place. The gauze is used to keep clumps of the insoluble jelly from mixing with the seed and is unnecessary with large seed. The seed is stirred with the hands or by means of a shovel until the liquid containing the bacteria has moistened each seed. When large quantities of seed are to be inoculated, the machine ordinarily used for treating seed for smut may be employed. The seed is spread out and allowed to dry in a shady place and is planted as soon as possible, preferably within 12 to 24 hours. Large seed should be planted at once and may be planted while damp. Each bottle is accompanied by full directions for use.



Circular 126

March, 1920

DEMONSTRATIONS CONVINCE

H. L. RUSSELL

K. L. HATCH



ANNUAL REPORT OF
THE AGRICULTURAL EXTENSION SERVICE
UNIVERSITY OF WISCONSIN
MADISON

What the Agricultural Extension Service Will Do for You

Find a market for your surplus dairy cattle.
Help find suitable purebred sires for you.
Organize a cow testing association in your neighborhood.
Plan economical rations for your livestock.
Show you how to select the laying hens.
Prove the value of purebred seeds.
Demonstrate how to succeed with alfalfa.
Send inoculation for your legumes.
Show you how to control smut, blight, and barley stripe.
Prescribe for your other plant diseases.
Tell you how best to fight bugs and insects.
Illustrate how to produce fruit free from defects.
Select pure strains of potatoes and certify the seed.
Help you to drain that wet spot.
Test your soil and prescribe helpful fertilizers.
Clear new land with less backache.
Send you plans for farm buildings.
Show you how to beautify your farm grounds cheaply.
Suggest helpful conveniences for the farm home.
Help you to improve the quality of your dairy products.
Show you how to keep farm accounts.
Form Boys' and Girls' Clubs for your children.
Assist Farmers' Clubs and Cooperative Organizations.
Arrange a Farmers' Meeting for your neighborhood.
Send you FREE bulletins and circulars.

For "First Aid" See Your County Agent

Demonstrations Convince

This is the day of action. The time for talking is past. Everybody wants to be "shown"—no less the farmer.

During the past year the extension work of the College of Agriculture has been planned with the demonstration purpose in mind. It has endeavored to show that its theories will work out in practice. If its teachings cannot be applied in a practical way they are useless.

The Experiment Station is willing to stand on the test of practical worth. The work of the college rests upon the foundation laid by the Experiment Station. The duty of the college, aside from the teaching of students, is that of **showing to the farmers the practical value of the Experiment Station results.**

DEMONSTRATIONS ON EXPERIMENT STATION FARMS

One phase of extension work that has been emphasized during the year was that of holding demonstrations of the results of experiments now in progress at the Station Farm at Madison and at the several branch experiment stations throughout the state.

More than 800 tobacco growers visited the Madison station to see just how the station was trying to control by breeding disease-resistant strains, root-rot, and the grasshopper pest, and various other lines of tobacco breeding work.

At another time 500 farmers came to see the results of feeding barley and whey to hogs, barley and silage to beef cattle, and the value of drainage as illustrated on the University marsh project. This land with its surface nearly on a level with the lake and which, a few years ago, grew only cat-tails and sedges, is now producing, where drained, a crop of 60 bushels of corn to the acre. Tile and fertilizer did it.

Nearly 2,000 other farmers went over the experimental plots on demonstration days held at the branch experiment stations.

FARM FIELDS TEACH TRUTHS

That the farm demonstration on the farmer's own land is the most effective way of teaching is clearly shown by a large number of field trials that have been carried on by county agents and extension specialists on individual farms. For this purpose

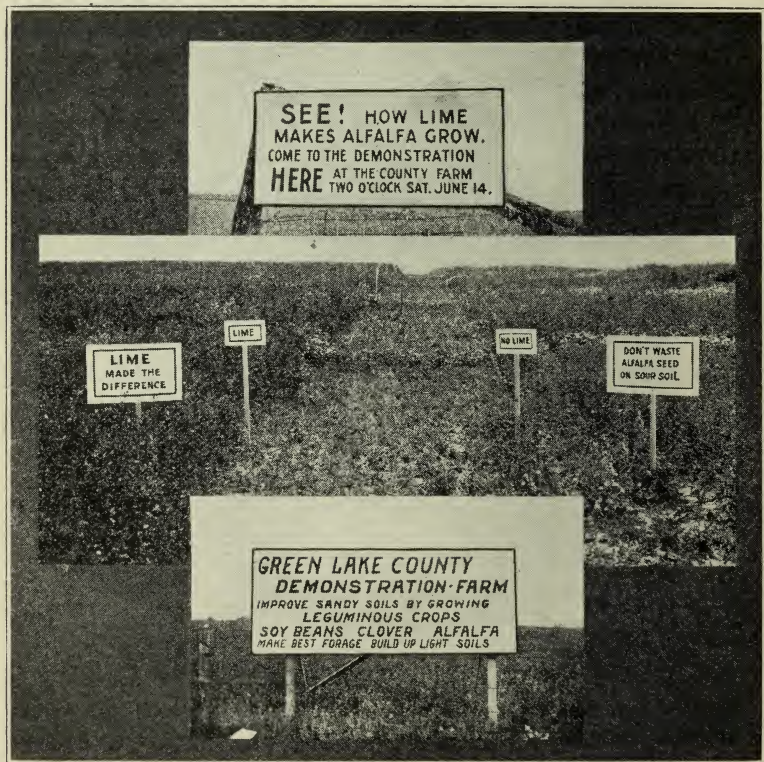


FIG. 1. ALFALFA SPEAKS FOR ITSELF

Alfalfa told its own story about lime requirement at the Green County Farm demonstration near Monroe. The difference in stand, color, and growth of the limed and no-lime area was easily recognized.

one or more public farms belonging to the state or county or privately owned farms, prominently located, have been chosen in each of the several counties as the ones most likely to yield large results. In such instances the plan of demonstration has been outlined by the college specialist in charge of this particular piece of work and the field meetings and demonstrations have been carried out in cooperation with county agents.

ALFALFA NEEDS LIME
(Agronomy Department)

That "lime, inoculation, and manure make alfalfa doubly sure" is shown by demonstration work conducted on 268 farms throughout the state in conjunction with members of the alfalfa order of the Wisconsin Experiment Association. That alfalfa and timothy, sown together on the same field make **the hay crop doubly sure** has likewise been demonstrated, particularly on the county farm at Monroe, Green County. Not only is alfalfa a good hay crop but it is also a good crop for the destruction of noxious weeds, such as Canada thistle, as was shown on several farms in the southeastern part of the state.



FIG. 2. INOCULATION—THE SECRET OF SOYBEAN SUCCESS

This tells the whole story of soybean failure and success, in the inoculated and uninoculated demonstration plots near Princeton, Green Lake County.

LEGUME INOCULATION IS WORTH WHILE
(Bacteriology Department)

"Does it pay to inoculate?" is a question often asked by growers of various leguminous crops. For several years the college has been engaged in the distribution of various legume cultures furnished to the farmer at cost for the purpose of inoculating seed before sowing. That this treatment is worth while has been demonstrated at many of the summer demon-

stration meetings held on county and state farms with certain legumes like alfalfa and soy beans. It has also been successful on individual farms where culture material has been used. The general tenor of reports received from the farmers using this material has been exceedingly favorable, particularly with reference to peas, soybeans, and alfalfa. The success of this work in past years has been such that during this year a much wider distribution of cultures has been made.

Inoculation material for the treatment of seed sufficient to plant over 18,000 acres has been distributed. The charge, 25 cents an acre, is sufficient only to cover the actual cost of materials used in its manufacture.

FERTILIZER PRODUCES RESULTS

(Soils Department)

To get the largest yields from the soil they must be kept in a high state of fertility, so that they will feed the crops with a "balanced" ration. This often means that commercial fertilizers must be used. Among the fertilizer demonstrations carried on during the past year, complete fertilizers on potato fields and acid phosphate for corn and oats have given most striking results.

The use of 300 pounds to the acre on the dark prairie soils in the vicinity of Dodgeville increased the yield of oats 17½ bushels an acre at a cost of \$4.50. On the same type of soil 125 pounds of a mixed fertilizer, 80 per cent acid phosphate, nearly doubled the yield of silage, the increase being from 8.7 to 15.8 tons to the acre.

STATE SOILS LABORATORY

(Soils Department)

The demand for the aid of the State Soils Laboratory in diagnosing the actual condition of soils is constantly increasing. During the last year 350 applications have been received, and 750 soil samples have been examined. The most valuable work is that done with groups of farmers in a neighborhood where the results of the analysis can be discussed. Three groups of farmers in different parts of Dunn county are cited as specific

examples. As a result of the work carried on with these groups this last year, 25 carloads of limestone were purchased and several tons of commercial fertilizer used in the county.

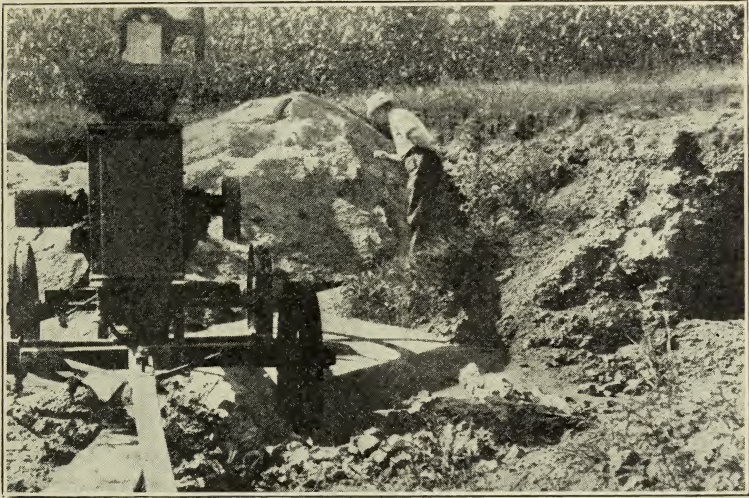


FIG. 3. WHY NOT GET RID OF THE "HAUL"?

The portable farm plant for crushing limestone is a practicable method of supplying lime when the rock is near at hand.

POTATO FIELDS SHOW RESULTS OF PROPER METHOD

(Horticultural Department)

Demonstration work in the use of certified seed potatoes, the proper rate and application of fertilizer, and the use of sprays for the control of insects and diseases has been continued, through the local potato growers' associations and on the farms of individual farmers. In practically all of these instances the results obtained from this kind of educational work have been so gratifying as to be unquestioned in their value.

Another important result of the potato improvement work has been the development of large areas in which but a single variety of potatoes is grown. The northern half of Lincoln County devoted almost wholly to the production of Green Mountains furnishes a striking example. A grand total of about 200,000 bushels of purebred Green Mountains was grown in this locality during the year just closed.

The state potato exposition, in which the combined efforts of this type of extension activity and the Wisconsin Potato Growers' Association are united, has developed into the largest potato show in the United States largely as the annual climax of the certified seed potato work.



FIG. 4. BETTER POTATOES MEAN A MORE PROFITABLE CASH CROP

Standard varieties grown at the Spooner Branch Station show the sandy soil farmers the way to increased returns.

POTATO AND ONION SEED TREATMENT

(Plant Pathology Department)

More than 70 per cent of growers of certified seed potato stock now treat their seed prior to planting, more than half of this number using corrosive sublimate for this purpose. Demonstration areas carried on in Barron and at Plainfield show the superiority of corrosive sublimate over formaldehyde in the control of both scab and black scurf. In Door County, where the corrosive sublimate treatment was used by one grower of 20 acres, a wood-treating vat was constructed and water-proofed with asphaltum paint. This was lent to surrounding neighbors who saw from the results of these demonstrations the value of the use of treated seed.

The control of onion smut through the use of formaldehyde continues to make headway in the truck regions of the state. In

the vicinity of Racine more than 100 acres were treated by this method this year. The results of this practice are indicated by a field demonstration which yielded 256 bushels of onions an acre upon the treated portion of the field while the untreated portion gave only 128 bushels an acre.



FIG. 5. CONTROL ONION SMUT

Will formaldehyde control onion smut? The two rows under examination had no treatment while those on each side had been protected by the use of formaldehyde. Are the results worth the treatment at a cost of \$5 an acre?

CABBAGE INSURANCE COSTS BUT LITTLE

(Plant Pathology Department)

The economic advantage of the extension lesson is well shown by an appeal to the cabbage growers in the Racine district to treat their seed for control of black rot and black leg: One farmer at Truesdell spent 35 cents for corrosive sublimate in order to treat the seed used by him for his crop. His field was practically free from black rot. A farmer near Union Grove, securing seed from the same source, thought it was too much trouble to treat it. As a result, 94 per cent of his crop was so seriously diseased that no cabbage heads formed. The seed in both of these cases was imported directly from Holland. The control of disease through seed treatment and the use of resistant strains has

practically restored the cabbage-growing industry to the lake-shore areas.

PRUNING PAYS

(Horticultural Department)

One of the best demonstration meetings of the year was held in conjunction with the county agent conference at Sturgeon Bay. The value of pruning, both in the control of pests and its effect on the production of cherries, was clearly shown by visits to several orchards upon which this work has been practiced. That spraying and pruning in proper combinations are necessary to the production of the highest quality of fruit was also demonstrated by Swartz Brothers on their farm near Waukesha.



FIG. 6. SPRAY TO FIGHT THE WORMS

Regular applications of spray mixtures were made in this Grant County orchard and the neighbors were invited in to see the results at apple-picking time. Seeing is believing.

PLANT DISEASE SURVEYS

(Plant Pathology Department)

New plant diseases are a constant menace to the crops of the state. Immediately following the detection, in Illinois, of two serious wheat diseases, "black smut" and "take-all," a survey was made in this state for the purpose of detecting their presence. No trace of either of these new maladies was found.

In cooperation with the office of Cereal Disease Investigations of the U. S. Department of Agriculture, a general state survey has been in progress. The grain fields of the state this last year were found to be remarkably free from smut. This was due in part to the extensive use of formaldehyde, under the leadership of the county agents, and in part to the peculiar seasonal conditions.

The discovery of the deadly potato wart disease in several counties in the East led to a search for these diseases in Wisconsin. In no case was there any evidence found of this disease in the state. The importance of our potato industry necessitates constant vigilance against the introduction of such exceedingly serious diseases as potato wart.

Potato late blight, however, made its appearance this season about three weeks earlier than usual. An active spraying campaign was at once begun, but owing to continued heavy rains in certain sections of the state, it was difficult to keep the vines adequately covered with bordeaux mixture at all times.

STEADY GROWTH IN COUNTY AGENT WORK

The last legislature increased the number of county agents that may be supplied in the state, from 33 to 45 for 1919 and to 50 for 1920. This rather unusual expansion was brought about by the effectiveness of the work done by the emergency agents who were placed in counties not having county agents during the war. This gave the farmers, as well as others, an opportunity to learn of this relatively new educational force. It resulted in an enlarged demand for county agents. In order to give to practical farmers, greater administrative responsibility for this work, the law was amended at the last legislative session so that the local county committee in charge now consists of the chairman of the county board, the county superintendent of schools, and three practical farmers, one of whom must be a member of the county board. The map shows the status of county agent work on July 1, 1919.

The county agent activities, during the year, were largely confined to the improvement of live stock; the improvement of grains and forage plants; soils and drainage work; potato improvement; boys' and girls' club work; and demonstrations

on farms in cooperation with the leading farmers of their counties, all of which were aided by appropriate publicity through the local press.

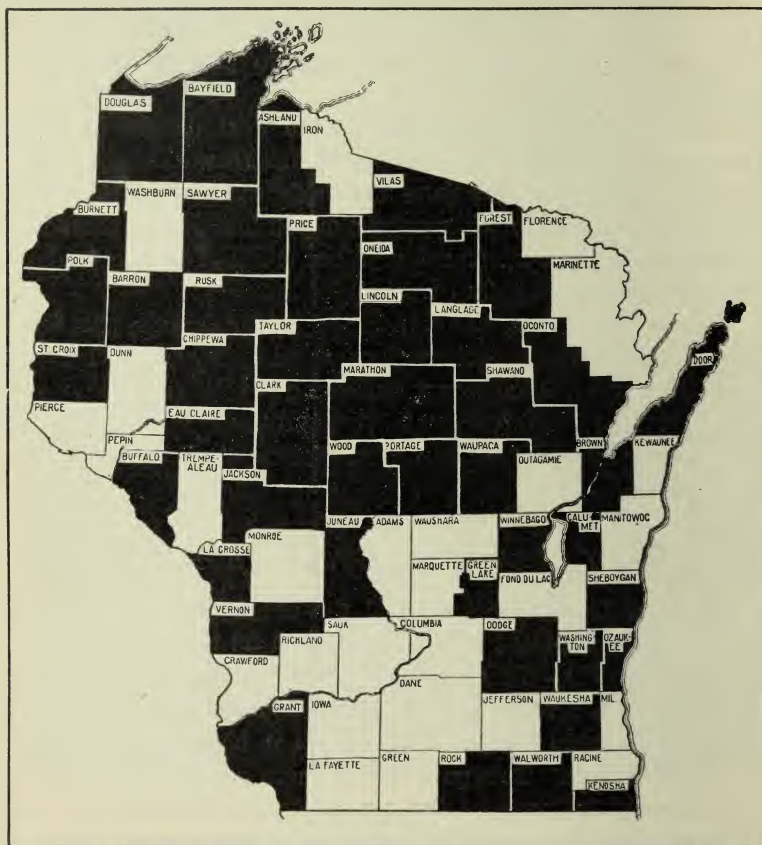


FIG. 7. COUNTIES HAVING AGRICULTURAL SERVICE MEN
Forty-four Wisconsin counties had provided for county agents July 1, 1919.

This data gives some notion of these activities:—

The total number of meetings held by county agents----	1,251
The total number of persons in attendance at these meetings -----	100,177
The total number of farm visits made by county agents--	12,609
The total number of requests for aid made by individual farmers from county agents -----	51,573
The total number of articles prepared for local newspapers by county agents -----	1,161

Never before has the influence for good of these men been so keenly felt. Every important agency now recognizes the leadership of the county agent. His work, like all educational work, is of such character as to make it difficult to measure its value in dollars and cents. However, the ultimate outcome of this demonstration work has a direct and positive economic value. The treatment of oats for smut; the spraying of potatoes and fruit trees for fungus diseases and insect attacks; drainage;

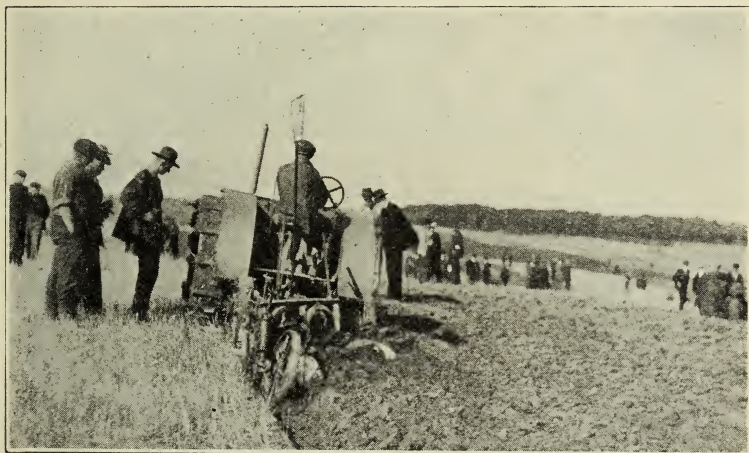


FIG. 8. A GOOD JOB OF PLOWING

The tractor plowing demonstration arranged by the county agent near Salem, Kenosha County, was very successful. No less than 10,000 farmers have had an opportunity to compare the work of the various tractors at the demonstrations held at various points in the state during the last year.

tiling and land clearing; including the use of stump-pullers, dynamite, and TNT; plowing contests, field trials with corn, soybeans, alfalfa, small grains, fertilizer and liming; the improvement that comes to a herd of cattle through cow testing and the introduction of a purebred sire; the value of poultry-culling demonstrations—the effect of all of these is to contribute directly and immediately to a more prosperous and permanent agriculture.

HOME DEMONSTRATION AGENTS SERVE

(Home Economics Department)

The conservation of food and clothing, made necessary by the war and carried out by means of home demonstration agents

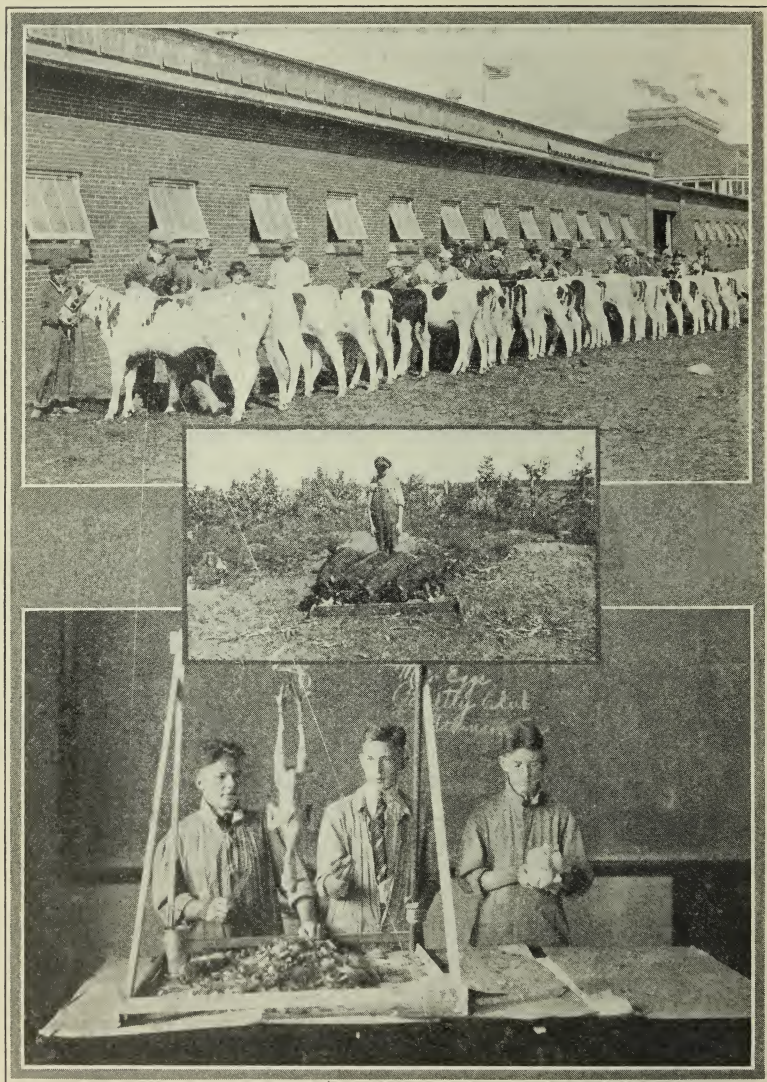


FIG. 9. MAKING FARMERS FOR THE FUTURE

(Upper) These are the best Holstein calves produced in the state by the boys and girls enrolled in the calf club work. More than 150 choice young animals of all dairy breeds were shown at the 1919 State Fair, out of a total enrollment of 1,018 in all parts of the state.

(Middle) This pen of prize-winning Berkshires at the Junior Live Stock Exposition was produced in the sand area of Wisconsin on soybean forage.

(Lower) After once seeing the Ft. Atkinson club team show how to dry-pick chickens and prepare them for the oven, no one forgets the object of the lesson.

located in the most populous counties, was continued as a piece of regular work for women in those counties demanding it. A modification of the county agent law makes possible the establishment of women agents by county boards, and permits the appropriation of money for this purpose. It is expected that this work, like that of the county agents, will gradually win its way when the women of the state learn more of its purpose, scope, and value.

WOMEN'S WORK MAKES STEADY PROGRESS

(Home Economics Department)

The influenza interfered with women's work during the past year. At the same time it stimulated a keener interest in certain phases of it, such as food for the sick and child nutrition. The necessity for keeping in trim to resist effectively the disease made the teaching of women workers particularly effective. Never before have Wisconsin women shown as keen interest in literature affecting work in the home and for the family. This is proved by the numerous requests for bulletins and the frequent inquiries for up-to-date books on all phases of home-making.

BADGER BOYS AND GIRLS BEST

A Wisconsin club team won championship honors in the Interstate contest held at Sioux City, Iowa, in September in competition with boys' and girls' clubs from twelve states. The winning team, girls from the Ellsworth high school, demonstrated the use of dye in "making old clothes new."

A half million dollars was added to the value of Wisconsin products during the past year by the young people of the state enrolled in these clubs. The net profit shown by the records of club members was \$270,000. The potato clubs did the biggest piece of business, a total of \$175,000 with an average individual return of a little over \$92 each. The pig and calf clubs are next in order. The 58 baby beef club members averaged \$83.23 each. Nearly 18,000 Badger boys and girls were enrolled in the various club activities.

PUBLICATIONS RENDER
SERVICE

*(Agricultural Journalism
Department)*



1. The weekly and daily papers of Wisconsin, as well as the farm journals, annually print hundreds of articles containing information on better agricultural methods. Reference is often made in articles to the free publications upon nearly every branch of farming issued by the experiment station or agricultural college and sent free of charge to residents of the state.

2. Hundreds of farmers read the new items about them through their neighbors, these bulletins or learn of the county agent, or some institute worker. Their letters requesting publications come to the college of agriculture mailing room, where from three to ten girls are needed to answer them.

3. When the farmer's letter arrives at the mailing room it is read, checked for available material, and then given to one of the clerks who takes the bulletin requested from the shelf, places it in an envelope and addresses it to Mr. Wisconsin Farmer.

4. Wisconsin agricultural bulletins and circulars have grown increasingly popular. A mailing truck has to be

used to carry the mail to and from the post-office and the Agricultural Hall.

5. "SELF-FEEDERS FOR HOGS",—it might be another of the many other publications—arrives at the farm in reply to the request. Most farmers are surprised to find the facts given in short, easy-to-read statements. Well-chosen pictures help to make the leaflet more valuable and usable.

6. After reading the bulletin it goes into the filing case or on top of the desk, where it forms a part of a very valuable but easy-to-get library on Wisconsin agriculture. Many farmers are now filing their bulletins for future use.

7. The bulletins and circulars are issued on many different subjects. There is some publication of interest to every farmer, his son, his daughter, or his wife. The home side of farming has not been neglected. These are a few of the publications of the last year.

8. Some 30,000 Wisconsin farmers now obtain these process of writing and filling publications. To simplify the a request, a mailing list has been established. If a farmer wants to get the bulletins regularly, he writes for a mailing card fills it out, signs his name, and sends it to the mailing room



EXTENSION INSTRUCTION STILL POPULAR

That extension teaching from the public platform is still popular is attested by the attendance on the 295 demonstration meetings and Farmers' Institutes held during the past year. Despite the serious interference of the influenza epidemic, which necessitated a cancellation of nearly a quarter of the projected meetings, more than 81,000 people in all parts of the state listened to extension teachers and institute workers. This record does not include the numerous other meetings directed by county agents.



FIG. 12. WISCONSIN GIRLS AT THE TOP

This team of girls representing the girls' dyeing club won first place in the interstate contest at Sioux City. Twelve states competed.

HOME ECONOMIC SPECIALISTS APPOINTED
(*Home Economics Department*)

In order to meet more directly the present day problems of the home, a staff of specialists for the various phases of home life have been provided. One woman worker is to devote her entire time to food and diet, another to child nutrition, another to clothing and fabrics, and a fourth to the various phases of home management.

With this staff of specialists direct service on these special problems is given to rural women's clubs and other organized groups of women.

MEETINGS MULTIPLY RESULTS

The results obtained in both experimental and demonstration work have been reduced to bulletin, chart, and lantern slide and in some instances have been reproduced on motion picture film and carried over the state for instructional purposes.

In order to unify plans and to prepare for this work, an annual conference of all extension workers, including county agents and farmers' institute instructors, is held at the college.



FIG. 13. UPPER WISCONSIN GATHERS AT ASHLAND

The branch station acts as host each year to the farmers of the northern section. The demonstrations are given in the fields, or at the short talk in the grove at the noon hour.

At this conference it was decided to intensify work in forage crops and self-feeders for hogs, soybeans, liming of acid soils, inoculation for legumes, and the use of better bulls.

While it is impossible to estimate these results with mathematical exactness, we do know that the amount of inoculation material sent out by the college increased from 7,000 to 18,000 bottles during the past year. In one county alone 15,000 acres of corn were interplanted to soybeans, and the aggregate amount of lime ordered by farmers attending four meetings in another county totaled 800 tons. The results of the purebred bull drive are given in another part of this report.

Meetings and institutes are used both to stimulate interest in the various lines of extension work carried on by the college and to secure action on work already launched.

RED MEN'S INTEREST SUSTAINED

The desire for agricultural information among the Indians on Wisconsin reservations is steadily growing. During the year institutes for Indian farmers have been held at six points in the state. These institutes were attended by from 25 per cent to 95 per cent of all the Indians on the various reservations—a record unequalled by any other group of farmers.



FIG. 14. RED MEN WANT FACTS ON FARMING

This sheep demonstration was held on the Odanah reservation, and was one of several meetings held among the Wisconsin Indians. The Indian can best be assimilated into the life of the nation through farming practices.

“MILK IN THE MOVIES”

(Dairy Department)

The use of the moving picture film in agricultural teaching work continues to grow in popularity. One of the most effective films produced for this purpose is the one entitled “Milk”. This picture shows the value of milk in the diet and is based upon the research work of this station. It has proved so popular that more than 30 copies of this film have been made for other states and Canada.

Other dairy extension work was a continuation of the butter- and cheese-scoring exhibitions and visiting cheese factories and creameries with a view to giving assistance in the production of a better quality of butter and cheese and the promotion of

a wider use of cottage cheese. The results of this latter kind of extension work are shown by the increased sales of cottage cheese as reported by various dairy companies in the cities where this work was carried on. The Waukesha Milk Company furnishes the following data for the first three months of the year which, while more striking than some others, illustrates the same point.

First three months of 1919	----	30,221	pounds of cottage cheese
“ “ “ “ 1918	----	8,679	“ “ “ “

Gain over previous year ----21,543 pounds of cottage cheese
or nearly 250 per cent.



FIG. 15. IS THERE MONEY IN HONEY?

There must be some reason for the awakening interest in the product of the busy bee. This shows the group in attendance at the Bee School held at the University during the summer of 1919.

BEE SCHOOLS DEVELOP MUCH INTEREST (*Economic Entomology Department*)

Working in cooperation with the State Beekeepers' Association, this department has been the means of stimulating much interest in bee culture during the last year. Many local associations have been organized and nearly 50 meetings have been held throughout the state, attended by 1,450 people especially interested in agriculture.

An entirely new mode of approach to agriculture problems has been through the development of bee schools. These schools

are held for a period of three days each in conjunction with a local association. In addition to the local schools, another, of five days, held at Madison during the summer was attended by more than 160 beekeepers from various parts of the state. The presentation of improved methods of culture, the marketing of honey, and the shortage of sweets has enlivened interest in the production of honey in this state. This industry has already assumed the stage of rapidly growing importance.



FIG. 16. DO YOU BELIEVE IN SOYBEANS?

If you don't believe in the value of soybeans for sandy soils ask any one of the 500 farmers who attended the demonstrations at the Spooner Branch Experiment Station last summer. Here is one group looking over the soybean plots.

ORGANIZED EFFORT SHOWS PRACTICAL WORTH

There is no other form of extension work so productive of results as that of working with organized groups. Individual service is justifiable only upon the basis that practical use be made of the individual work in teaching farmers of the locality through the results of a demonstration conducted on an individual farm. The college is not justified in the expenditure of public funds for the assistance of individual farmers, except that such service may be multiplied many times through the demonstration of results secured to a larger group.

The value of cooperative effort is amply shown by various organizations that have united with the college in the carrying out of certain well-established plans during the last year.

COOPERATIVE PURCHASE OF FEED SAVES MONEY

(Animal Husbandry Department)

A splendid opportunity for the cooperative purchase of feed is afforded to the 103 cow-testing associations now in active operation in the state. The Luck-Milltown association where 135 tons of feed were purchased at an average saving of \$6 a ton over current retail prices, making a total saving to this one association on purchase of feed of \$810, may be given as an



FIG. 17. COW-TESTING ASSOCIATIONS BUY COOPERATIVELY
Luck-Milltown Association members unload five cars of feed purchased at a saving of \$810.

example. This practice generally applied by all the associations throughout the state would effect a saving of over three quarters of a million dollars annually, to the membership of the associations alone!

The Register of Production, instituted last year in cooperation with the Wisconsin Dairymen's Association, has already enrolled during the first year of its operation 271 animals each with a butterfat record of more than 365 pounds a year or "a pound a day." In addition to identifying animals which may be used for breeding purposes, these records also give an added selling value to the cows qualifying for entry. A striking example is that of a grade Jersey cow belonging to one of the members of the Ft. Atkinson association. This cow produced 500 pounds

of butterfat during the year. A buyer, who did not have the faith to pay \$300 for her before she was placed on test, actually paid \$400 for her after the record was made.

Outside buyers of dairy cattle are particularly anxious to purchase from farmers who belong to these associations. Such records as are required by these testing associations also enable farmers to check the economy of their feeding operations. This soon results in the building of silos and in the production of high protein forage plants. These practices, of course, lead to more economical production and larger profits in dairy farming. One hundred and three cow-testing associations are now in active operation and many more could be easily organized were it possible, at the present time, to secure competent testers for this work.

This work was begun and wholly maintained for several years by the Wisconsin Dairymen's Association. In 1915 the Agricultural College and U. S. Department of Agriculture joined forces with the Wisconsin Dairymen's Association, further developing and extending the "get-rid-of-the-boarder-cow" movement.

TABLE I.—A DECADE OF COW-TESTING WORK IN WISCONSIN

Date	No. of Associations	No. of Members	No. of Cows on Test
July 1, 1910.....	13	403	4,320
July 1, 1911.....	10	339	4,200
July 1, 1912.....	12	360	4,500
July 1, 1913.....	17	527	7,480
July 1, 1914.....	28	868	13,920
July 1, 1915.....	39	1,209	19,133
July 1, 1916.....	52	1,614	25,871
July 1, 1917.....	81	2,417	39,739
July 1, 1918.....	112	3,501	54,661
July 1, 1919.....	115	3,594	52,591

PUREBRED BULLS IN PLACE OF SCRUBS

(Animal Husbandry Department)

Early in the year in cooperation with the Wisconsin Live Stock Breeders' Association, the college undertook an educational campaign for the eradication of scrub bulls from Wisconsin herds. Here again the organized efforts during the last year of cow-testing associations, breed associations, and groups of farmers have led to the elimination of the scrub bull from nearly 2000 herds in this state and the substitution therefor of purebred males of the breed prominent in the community.

PUREBRED BULLS MAKE BETTER BEEVES



THIS SCRUB SIRE
THIS GRADE DAM

PRODUCED



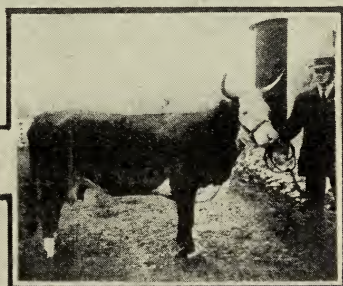
THIS SCRUB

WHICH?



THIS PURE BRED SIRE
THIS SCRUB DAM

PRODUCED



THIS GOOD GRADE

BETTER WISCONSIN CAMPAIGN

(From a Michigan Demonstration)

FIG. 18. PUREBRED BULLS PAY

This chart displayed in many localities in the state has aided materially the increase in the number of purebred sires in Wisconsin herds.

One striking example of collective effort in this work is in the organization of sales to which animals were consigned by the breeders and sold at public auction to farmers who had never before used a purebred bull with their herd. From data gathered it appears that approximately 30 per cent of Wisconsin farmers are now using purebred bulls. This movement has attracted wide-spread attention and the U. S. Department of Agriculture has recently inaugurated a national movement along similar lines. In Wisconsin the campaign will be pushed by the selection of individual townships in which conditions favor the effort to place purebred sires at the head of every herd.



FIG. 19. DAIRY DEMONSTRATION ON BREEDER'S FARM

The Guernsey breeders' picnic at Elderon was the forerunner of bigger and better things in Marathon County.

DAIRY CATTLE DEMAND INCREASES (*Animal Husbandry Department*)

The educational work in the organization of calf clubs, the purebred sire campaign, and cow testing association work throughout the nation continues to bear fruit in an ever increasing demand for Wisconsin dairy cattle.

The market demands—

1. Grade or purebred dairy cattle.
2. Cows or offspring of cows of known production.
3. Strong vigorous dairy cattle free from disease.

Since such animals are best obtained through the organizations that have been fostered by the College of Agriculture we have been called upon to assist outside buyers in locating over a million dollars worth of dairy cattle to be shipped to other states during the past year. The animals were sold at much higher prices than can be obtained for animals of unknown breeding and production.



FIG. 20. WATCHING TNT WORK

Seeing the results of a charge of TNT at a Marathon County demonstration.

A NEW EXPLOSIVE FOR LAND RECLAMATION

(Agricultural Engineering Department)

At the signing of the armistice the government had on hand many million pounds of TNT, the high-power explosive, which was no longer needed for war purposes. Thousands of tons of this material were dumped into the sea. The importance of



FIG. 21. WHAT TILE DRAINAGE DOES

This hay crop was raised in 1919 on an Ozaukee County farm. The land had not produced enough in the ten years previous to tile drainage (installed in 1918) to pay for the labor put upon it.



FIG. 22. DOES DRAINAGE PAY?

The tilled field on the right side of the fence produced 20 tons of silage corn to the acre while the untilled land on the left grew only marsh grass pasture. Drainage made the difference.

utilizing this war explosive in some productive peace time industry was early recognized and efforts immediately made to secure a sufficient quantity from the Washington authorities to test its adaptability to land reclamation. Through Congressman A. P. Nelson a considerable quantity—200,000 pounds—of this salvaged material was secured for demonstrational use in the removal of stumps in upper Wisconsin. After its value as an explosive had been accurately tested by holding demonstrations which were attended by nearly 2000 farmers the remainder of the supply was utilized in field demonstrations by more than 5000 farmers in 15 counties of the state.

The success which attended this effort has been very marked. While TNT, by virtue of its high explosive power, is more shattering than dynamite when used in large amounts, the use of small charges equally distributed gives excellent satisfaction and indicates that it is fully one-third more effective than 20 per cent dynamite. The demand for increased use of explosives in land clearing which has been developed as a result of the use of TNT and the land clearing trains that have been run by the college are resulting this winter in the purchase of larger quantities of explosives than ever before. Wisconsin is now using over three times as much agricultural explosive as any other state.

INCREASED ACREAGE THROUGH DRAINAGE

(Agricultural Engineering Department)

That drainage is effective in land reclamation has been amply shown on the farms of 11 individual farmers, during the year just closed. In addition 13,840 acres have been organized into drainage districts during the year. Under the drainage law of the state cooperative effort is necessary in order to secure the reclamation of any large tract of land. Such cooperation is greatly encouraged by the effectiveness of drainage through demonstrations on individual farms.

On 29 additional farms which plan on installing drainage systems next year the necessary preliminary surveys were made. These farms will later be used as demonstration centers for further extending land reclamation.

DISEASE DIAGNOSIS AND SERUM DISTRIBUTION

(Veterinary Science Department)

Though the ravages of hog cholera have materially decreased during the past few years, the manufacture and distribution of hog cholera serum has been continued. The total amount distributed at cost of production, was 517,655 cubic centimeters.

The examination of specimens sent in by local veterinarians to aid them in disease diagnosis has been steadily increasing, 173 of the 420 licensed veterinarians in the state having taken

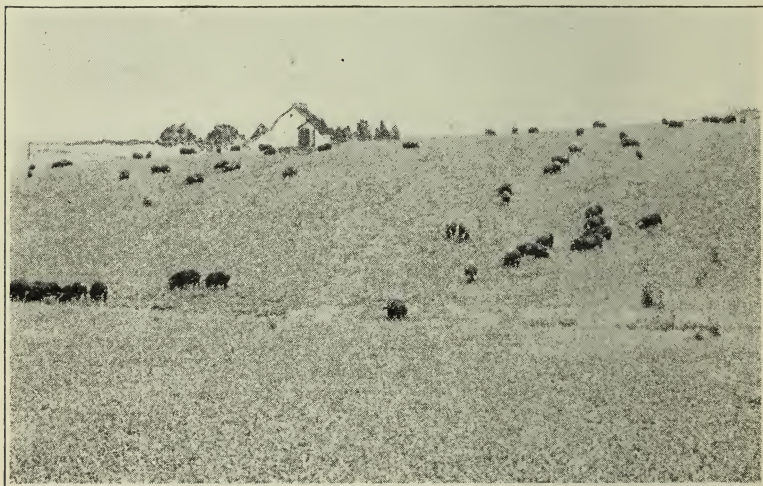


FIG. 13. REDUCING THE COST OF PORK PRODUCTION

Forage crops and self-feeders go hand in hand in making efficient pork production. The hog crop in Wisconsin is an important one.

advantage of the service offered by the veterinary department during the year. A total of 2,690 specimens were examined for Wisconsin practitioners by the laboratory.

DISTRIBUTION OF TUBERCULIN

(Bacteriology Department)

During this last year 147,458 doses of tuberculin has been supplied to the State Live Stock Sanitary Board for use in the diagnosis of tuberculosis in cattle. An additional amount of special tuberculin has also been supplied for tests known as the

ophthalmic and intradermal tests, making the total amount of diagnostic material turned over to the state board of 170,000 doses, or approximately 53 per cent more than during the previous year. This tuberculin, if purchased through the ordinary commercial channels, would have cost \$4,250. With the probable expansion of the campaign for the eradication of bovine tuberculosis, which is now being aggressively pushed by the State Department of Agriculture, it seems highly probable that an increase in the quantity of tuberculin will be required.

Under these circumstances it will soon become necessary for the legislature to make specific provision for the preparation of this material, if it is distributed free to the farmers of the state through the State Department of Agriculture.

AWAKENED INTEREST IN RURAL HYGIENE

(Bacteriology Department)

Lectures and demonstrations on rural health and sanitation have been given in connection with twelve of the State and County Normal training schools. Much interest has been shown by these prospective teachers in the problem of rural health improvement. Through the medium of charts, microscopic material, and lantern slides it has been possible to bring home the essential facts in connection with rural hygiene, more strikingly than in any other way yet devised. More than 500 prospective teachers have thus been reached. These young people inspired by this message will carry the gospel of better health directly into the rural schools of the state.



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THE HOT LUNCH IN RURAL SCHOOLS



EXTENSION SERVICE OF THE COLLEGE OF AGRICULTURE
THE UNIVERSITY OF WISCONSIN

HOW TO MAKE A SUCCESS OF THE
HOT LUNCH. 1. Make the work part of
every day's program, not an additional task
to teacher and pupils. 2. Create a demand from
parents and pupils for the hot school lunch. Invite
mothers to the school and plan lunches with them.
3. Let the whole community share in your project.
4. Prepare simple, nutritious dishes. 5. Make de-
tailed plans for cooperation in the community and
think more of the success of the project than of
getting credit for it.

The Hot Lunch in Rural Schools

GLADYS STILLMAN

Hot soup or a hot drink served at school makes a good meal of the cold lunch carried in the lunch box or dinner pail. One cold meal for one day may not mean much, but hundreds of cold meals in the course of the eight years in school may mean the difference between a poorly nourished child and a well-nourished child; poor health and good health; poor digestion and good digestion.

The hot lunch means that the child will be better nourished. Better nourished, he can do better school work, for what is good for the body is good for the brain. With a better body and better school training, the child is better fitted to be useful and successful when he grows up. No amount of good food and care in later years can make up for the lack of right food for the growing child.

The serving of a hot dish is one of the ways to overcome the hardship to the country child of taking his cold lunch to school. Every mother should see that her child has this addition to the lunch-box meal for the sake of the child's health. Every teacher should encourage the serving of the noon meal because it means a higher standard of school work.

WHAT IS THE HOT LUNCH?

The hot lunch is that part of the noon lunch which is prepared at school. It adds to, but does not take the place of, the lunch brought from home. It need not mean more than the serving of one hot dish, such as cocoa, or a nutritious soup.

WHY THE HOT LUNCH?

The advantages of the hot lunch, properly conducted, are many. Better health is, perhaps, the most important. The children enjoy the lunch more if there is a hot dish. Better digestion results from the addition of the hot food. Eating of the lunch under the teacher's supervision results in slower eating and thorough chewing of the food. Hasty eating causes indigestion and consequent ill health. Better table manners are encouraged, since

each child waits until all the others are served before beginning to eat, and waits until all are through before being excused from his desk. Better serving, selection, and clearing away of food are taught. Better school work results from better health conditions. Better school attendance comes as a result of the enjoyment the children get from the party spirit which the school lunch affords.

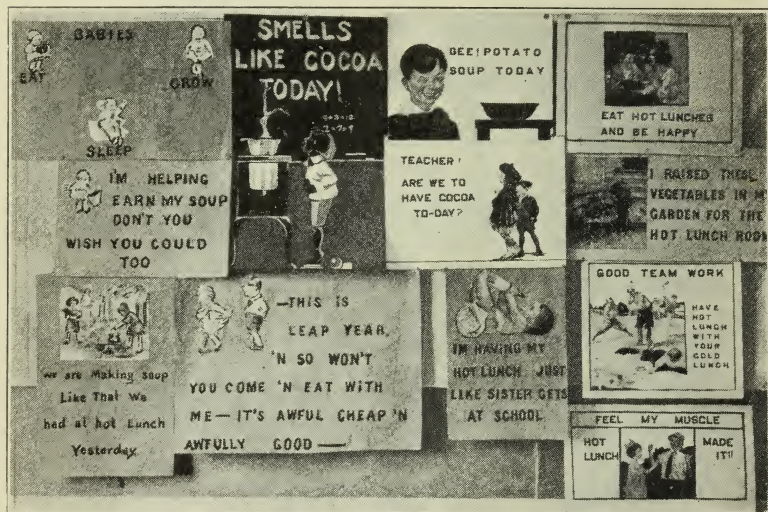


FIG. 1. POSTERS HELP ADVERTISE THE HOT LUNCH
These posters were prepared by pupils in rural schools.

HOW TO PROVIDE A HOT LUNCH

The equipment for serving hot lunches may be obtained in any of these ways: The school board may finance it; some interested patron may donate it; the Woman's Club, Ladies' Aid, or Parent-Teacher's Association may donate it; the school may give an entertainment or box supper, the proceeds to be used for purchasing the necessary equipment; a shower may be given and many of the utensils supplied. If a table and cupboard are needed, the larger boys can make them out of dry goods boxes or old desks.

The food materials may be obtained by the method best suited to the community. The school board may allow a certain sum for this purpose and the teacher purchase all the supplies. The children may bring two pennies a day or 10 cents a week to cover the expense. Each child may bring his share of the supplies daily or weekly. Each child may bring a small share of the supplies and a small sum of money weekly. The school may buy all the supplies with money earned in some way.

WHAT EQUIPMENT IS NEEDED

At first, it is advisable to serve only a cup of hot milk, hot cocoa, or soup, as the hot dish. The equipment needed for this

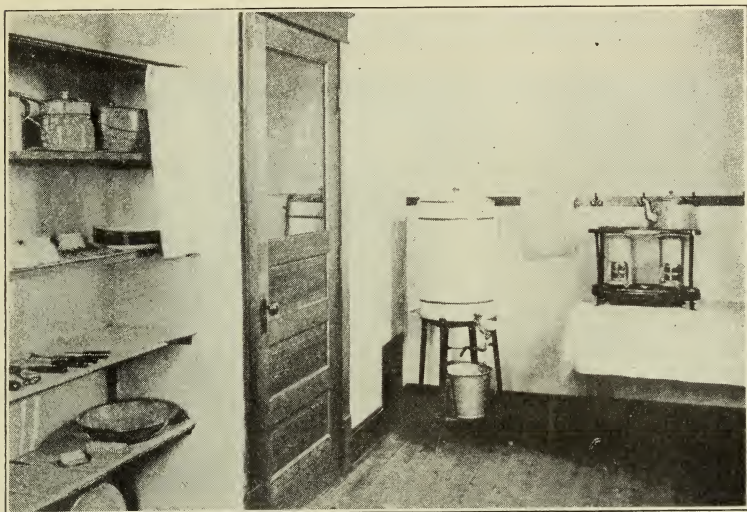


FIG. 2. THE EQUIPMENT NEED NOT BE EXPENSIVE

No matter how simple the equipment is, it should be kept in order.

purpose is very simple and inexpensive. Later more equipment may be added. There should be:

1. A two- or three-burner oil stove. This will also be useful in community affairs.

2. A small table or its equivalent, a dry goods box. The lower part may be enclosed as a cupboard for the dishes and cutlery. A door in front will keep out the dust and mice. Lard tins or cracker boxes may serve as containers for materials attractive to mice.

3. Dishes for work in preparing food:

granite kettle with tin cover to fit, size according to number of pupils to serve	
large long-handled spoon	fork
teaspoon or measuring spoon	paring knives
tablespoon	potato masher
measuring cup	vegetable brush
quart measure	can opener

A teakettle, an oven, and a few baking pans are useful, but not necessary. A one-compartment fireless cooker made by the

pupils will aid greatly in decreasing the labor involved in preparing the lunch.

4. Dishes for serving:

For each child a large cup, with a handle, a spoon, and a paper napkin. These may be brought from home by each child and kept at school or they may be supplied as part of the equipment.

For serving the food, especially soup and cocoa, a large pitcher is useful.

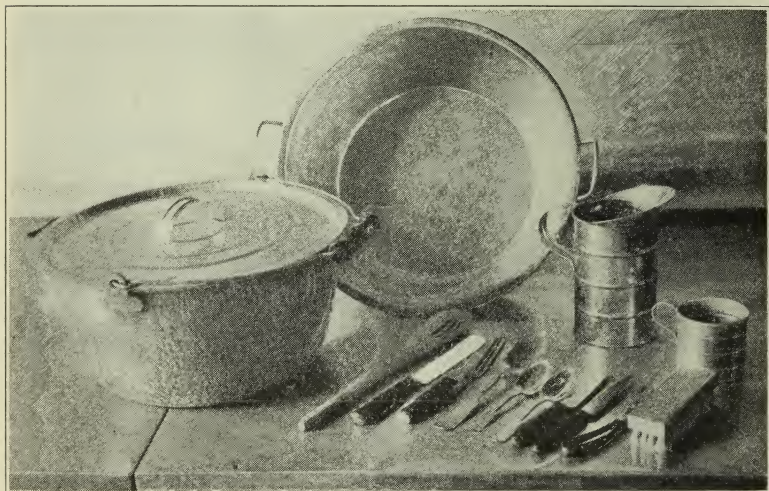


FIG. 3. THIS MUCH EQUIPMENT IS ALMOST NECESSARY

Dishes enough to allow the cooking squad to work without loss of time and with the best standards of work are included in this equipment.

5. Cleaning equipment:

dishpans

dish towels

dishcloths

soap

cleanser

sapolio

A COOKING PLAN FOR THE HOT LUNCH

The rural teacher with her many classes a day has not sufficient time to do all the work connected with the lunch. Even though she did, the real educational value would be lost. With the help of the students, the teacher can supervise and teach the pupils how to do the work. The benefits derived from the serving of the hot lunch will depend upon its management.

At the beginning of each week the teacher may appoint two groups of two or three each, the number depending upon how many are to be served, from among the boys and girls. The older children should take charge and the younger children assist.

Group I should prepare and serve the hot dish. The preparation should be carried on before school and at recess, so as not to take any of the regular school time. The dish should be ready to serve directly at the noon hour in order that the children may not miss any more of their noon play than is necessary.



FIG. 4. PREPARING THE HOT DISH
The captain and her aids have started the lunch.

The duties of Group I may be to:

1. Prepare vegetables and other food necessary for the hot dish.
2. See that the equipment is in order.
3. Start the food cooking at the proper time, either before school in the morning or at the morning recess. Some of the vegetables, such as beans, will need to be put to soak the night before.
4. Have the water ready for the children to wash their hands.
5. Have the cups and napkins in place or passed to each desk.
6. Make final arrangements a few minutes before the noon hour, for serving the lunch.
7. Serve the hot dish promptly at the noon hour.

The duties of Group II should then be to:

1. Collect soiled dishes and wash them.
2. Put equipment in order.
3. Clean the room for the afternoon session.
4. Empty the garbage.

In order to make the work more interesting it may be carried out by means of a game of soldiers. The groups may be called Company I and Company II. The teacher should be called the major. The one taking charge of each company should act as captain, and have one or two privates as helpers. The captain should assume full charge of his company and report to the major.



FIG. 5. THE CLEANING-UP SQUAD AT WORK

Company II is doing its part of the work. Boys and girls share alike in the work.

The duties of the companies may be posted near the place of work so that the captain may be sure that all the duties have been performed.

Credit in discipline or home economics, if it is given in the school, may be given for the work connected with the hot lunch if it proves difficult to get willing helpers. On the contrary, most children are eager to take part in the work.

GOOD MANNERS ARE PART OF THE HOT LUNCH PLAN

To get the full advantage of having the pupils eat together and under the eye of the teacher these points should be observed:

1. The room should be thoroughly aired before lunch is eaten.
2. The children should wash their hands before eating.



FIG. 6. "WASHING UP" FOR LUNCH

With the teacher there to inspect the process, washing hands becomes fun rather than duty.

3. The desk should be cleared and a paper napkin or a piece of oilcloth spread for a tablecloth.
4. The lunch should be spread on the napkin and the lunch pail or box put under the desk, out of sight.
5. Lunch should be eaten in the right order, dessert last.
6. A fork or spoon should be used to carry food to the mouth.
7. The children should remain in their seats until all have finished eating. This will prevent hasty eating.
8. The children should be permitted to drink water with their lunch, but they must not be allowed to swallow their food hurriedly by washing it down with water.

9. The children should be taught to eat slowly and quietly. Hasty eating causes indigestion and consequent ill health.
10. The conversation should be kept pleasant.
11. The teacher's manner of eating will be the standard for the table manners of the pupils, as children are very imitative. The teacher should prepare her lunch at her desk in the same manner as the pupils.

The lunch offers an excellent opportunity to overcome peculiar food habits, as the group spirit allows no personal preferences. Through the hot lunch many a child learns to like a nutritious food which he would not touch at home. .



FIG. 7. THE HOT LUNCH ENCOURAGES AN ORDERLY NOON MEAL

Each child uses his desk for a table, and the teacher uses her own desk, so that she may face the pupils. Her manners are the standard for the pupils.

Neatness in general appearance, such as clean hands, and clean aprons for the cooks, should be encouraged. Simple aprons and holders can be made in the sewing class from toweling or flour sacks. The best standards of dishwashing should be carefully followed.

SUITABLE DISHES TO SERVE AT SCHOOL LUNCH

Beverages, milk soups, and breakfast foods are the best dishes to prepare for the hot school lunch, but creamed vegetables are added to many menus. The beverages include hot milk and cocoa;

milk soups may be made of corn, peas, beans, potatoes, tomatoes, and rice; breakfast foods such as oatmeal, cream of wheat, and rice may be served.

RECIPES

(All measurements are level.)

Cocoa (Serves 12)

$\frac{1}{2}$ cup cocoa	2 cups boiling water
$\frac{1}{2}$ cup sugar	8 cups or 2 quarts milk

Mix cocoa and sugar well. Add the boiling water and boil from three to five minutes. This cooks the starch in cocoa and makes it easier to digest. Add the milk and set in a pan of hot water to cook till ready to serve. This may be prepared before school and reheated in time to serve. If a scum forms on top, beat with egg beater.

WHITE SAUCE (Serves 12)

3 cups milk	6 tablespoons fat
6 tablespoons flour	$1\frac{1}{2}$ teaspoons salt
$\frac{1}{2}$ teaspoon paprika	

Scald the milk. Add the fat, salt and the flour, mixed smooth with an equal amount of the cold milk. Cook five minutes to cook the starch in the flour, stirring constantly to prevent lumping and burning. Season and serve.

This recipe allows about 4 tablespoons of sauce to each pupil. It may be used for baked potatoes, creamed potatoes, creamed vegetables, etc.

CREAM OF CORN SOUP (Serves 12)

1 $\frac{1}{2}$ pint can or 3 cups corn	$\frac{1}{2}$ cup flour
3 cups boiling water	1 tablespoon salt
6 cups or $1\frac{1}{2}$ quarts milk	1 teaspoon celery salt
1 slice salt pork	$\frac{1}{4}$ teaspoon pepper
1 small onion	

Cut salt pork in cubes and fry with thinly sliced onion till brown. (Use same dish in which the soup is to be made.) Add the corn and boiling water and simmer 15 minutes. Add the flour which has been mixed smooth with an equal amount of cold water and boil five minutes to cook the starch in the flour and stir constantly to prevent lumping and burning. Turn in the milk and bring to boiling point. Season and serve. The pork may be omitted and the onion browned in $\frac{1}{2}$ cup of fat instead of the pork.

CREAM OF PEA OR BEAN SOUP (Serves 12)

$1\frac{1}{4}$ cups dry peas or beans	$\frac{1}{3}$ cup flour
3 cups boiling water	2 teaspoons salt
6 cups or $1\frac{1}{2}$ quarts milk	$\frac{1}{4}$ teaspoon celery salt
$\frac{1}{4}$ cup fat	$\frac{1}{4}$ teaspoon pepper
1 small onion	

Soak peas over night in cold water. Cook till tender, putting on before school in the morning. Drain and mash with potato masher. Add four cups boiling water to the pulp, also the finely sliced onion, fat and the flour mixed smooth with an equal amount of cold water and boil for five minutes to cook starch in flour. Stir constantly to prevent lumping and burning. Add the milk and bring to boiling point. Season and serve.

CREAM OF CARROT SOUP (Serves 12)

4 cups diced carrots	3 teaspoons salt
3 cups hot water	$\frac{1}{2}$ cup fat
$\frac{1}{2}$ cup flour	8 cups or 2 quarts milk
1 small onion	$\frac{1}{2}$ teaspoon celery salt
$\frac{1}{2}$ teaspoon paprika	

Cook the diced carrots in the 3 cups of hot water till tender. Add the onion, salt, fat, and the flour mixed smooth with an equal amount of cold water. Boil five minutes to cook starch in flour, stirring constantly to prevent lumping and burning. Add the milk and bring to boiling point. Season and serve.

CREAM OF PEANUT BUTTER SOUP (Serves 12)

10 tablespoons peanut butter	2 teaspoons salt
1 cup hot water	$\frac{1}{2}$ teaspoon paprika
1 small onion	$\frac{1}{2}$ teaspoon celery salt
$\frac{1}{2}$ cup flour	10 cups or $2\frac{1}{2}$ quarts milk

Bring the peanut butter, hot water, onion, and salt to a boil. Add one quart of milk and heat, then add the flour, mixed smooth with an equal amount of cold water. Boil five minutes to cook starch, stirring constantly to prevent lumping and burning. Add the rest of the milk and bring to the boiling point. Season and serve.

POTATO SOUP (Serves 12)

7 medium sized potatoes	2 tablespoons fat
3 cups boiling water	4 teaspoons salt
1 small onion	4 tablespoons flour
6 cups or $1\frac{1}{2}$ quarts milk	1 teaspoon celery salt

Bit of bayleaf

Peel potatoes, cut in small pieces, and cook till soft in 6 cups boiling salted water ($1\frac{1}{2}$ teaspoons salt). Without draining, mash the potatoes, add the fat, thinly sliced onion and flour mixed smooth with equal parts of cold water and boil five minutes to cook starch in flour and stir constantly to prevent lumping and burning. Add the milk and bring to boiling point. Season and serve.

TOMATO SOUP (Serves 12)

1 quart can tomatoes	$\frac{1}{2}$ cup flour
$\frac{1}{2}$ teaspoon soda	6 cups or $1\frac{1}{2}$ quarts milk
$\frac{1}{4}$ teaspoon salt	$\frac{1}{4}$ teaspoon pepper
1 small onion	$\frac{1}{2}$ teaspoon celery salt
$\frac{1}{2}$ cup fat	Bit of bayleaf

Heat tomatoes and mash well with fork or potato masher. Add soda, onion, salt, fat and flour mixed with equal amounts of cold water and boil five minutes to cook starch in flour and stir constantly to prevent lumping and burning. Scald milk in double boiler and just before serving turn hot tomato mixture gradually into the hot milk, stirring all the time to prevent curdling. Season and serve immediately.

CORN AND POTATO CHOWDER (Serves 12)

3 cups raw potato cut in small cubes	2 ounces salt pork
2 cups canned corn	1 small onion chopped fine
10 cups or $2\frac{1}{2}$ quarts milk	$\frac{1}{2}$ teaspoon celery salt
salt to taste	$\frac{1}{2}$ teaspoon paprika

Cut the salt pork in small pieces and cook with onion until light brown. Add the potato and cook about ten minutes. Add the corn and the milk and cook until the potatoes are tender. Season and serve.

OATMEAL (Serves 12)

2 cups oatmeal 8 cups boiling water 1 teaspoon salt

Bring water and salt to boil in top of double boiler. Add oatmeal slowly and boil five minutes, directly over fire, stirring constantly to prevent lumping and burning. Set over bottom part of double boiler and cook three hours; $\frac{1}{2}$ cup washed raisins may be added the last half hour of cooking to give variety. Serve with warm milk and sugar.

CREAM OF WHEAT (Serves 12)

$1\frac{1}{2}$ cups cream of wheat 8 cups water 1 teaspoon salt

Bring water and salt to boil in top of double boiler. Add cream of wheat slowly and boil five minutes directly over fire, stirring constantly to prevent lumping and burning. Set over bottom part of double boiler and cook thirty minutes. $\frac{1}{2}$ cup washed raisins may be added the last half hour of cooking to give variety. Serve with warm milk and sugar.

RICE (Serves 12-14)

2 cups rice 3 cups boiling water
3 cups milk 1 teaspoon salt

Bring water and salt to boil in top of double boiler. Add well washed rice gradually. Boil five minutes on top of stove, stirring with a fork to prevent sticking to the dish and burning. Set over bottom of double boiler and cook until rice has absorbed water. Add warm milk and continue cooking about $1\frac{1}{2}$ hours in all or until kernels are soft.



FIG. 8. THE DESKS SHOULD BE PREPARED NEATLY

A paper napkin for tablecloth and a careful arrangement of food help to make the meal appetizing.

A double boiler may be made by using the cooking kettle for the upper part and the dish pan for the lower part containing the water. A coffee can cover can be used to keep the upper part up

from the bottom of the lower part. The fat used may be butter, butter substitutes, such as oleo, lard compounds, cottonseed oil, corn oil or drippings (such as pork or bacon).

Remember that:

1. Starch in flour and cocoa is hard to digest unless boiled.
2. Dishes of this sort are not appetizing unless carefully seasoned.
3. An attractive dish may be ruined by the serving.
4. Paper or oil cloth napkins should be spread on the desks.
5. Children should be encouraged to bring appropriate foods in the lunch box.

SUGGESTED MENU FOR A MONTH

Monday	Tuesday	Wednesday	Thursday	Friday
1. Cream of Potato Soup	Cocoa	Creamed Carrots	Cream of Bean Soup	Cream of Tomato Soup
2. Cream of Corn Soup	Oatmeal with Raisins and Hot Milk	Cream of Pea Soup	Cocoa	Creamed Potatoes
3. Cream of Peanut Butter Soup	Cocoa	Cream of Carrot Soup	Corn and Potato Chowder	Rice with Raisins and Hot Milk
4. Cream of Wheat with Dates and Hot Milk	Cream of Tomato Soup	Cocoa	Cream of Potato Soup	Cream of Corn Soup

If an oven is included in the equipment baked dishes may take the place of some of the dishes on this menu.

When the hot lunch is planned in this way the children's lunch boxes may be packed to better advantage. If it is desired to have the hot lunch something of a surprise to the pupils it might be arranged to give the mothers the menu.

THE SCHOOL LUNCH BOX

The container. For the occasional lunch, bags and boxes that one has on hand may be used, but for the daily lunch a permanent container should be selected. The box should be of odorless material, durable, light, easy to carry and should have some means of ventilation.

1. Tin boxes or pails with perforated lids are the best type as they can be easily cleaned by washing, scalding, and airing. The more expensive tin boxes are provided with different compart-

ments, folding cups, knives, forks, etc. The thermos lunch box is ideal but expensive.

2. The fiber boxes are inexpensive, but not durable, having to be replaced often. They are easily soiled and cannot be cleaned but can be well aired. This type as well as the tin should be ventilated.

3. Homemade lunch boxes may be made without trouble or expense and thrown away after the lunch is eaten.

4. Baskets may be used although the food dries out quickly and is apt to freeze in the cold weather. The lunch must be well wrapped to protect it from dust and insects.

5. The folding lunch box when not in use may be folded, strapped with the books and carried home. It should be well aired.

Packing of the lunch. The lunch should be neat and attractive. In packing the lunch first line the container with plain paper napkins. (Do not use highly colored napkins in the lunch box. Moisture will make the colors run and the food will be unsightly.) Then wrap each article of food separately in waxed paper so as to prevent the foods from being shaken about. The empty spaces may be filled in neatly with paper. Liquid or semi-liquid foods should be carried in tightly sealed jars.



FIG. 9. A WELL-PACKED LUNCH BOX

By inviting the mothers to share in the plans for the lunch, better menus may be arranged. Children may be taught to pack their own boxes.

The children should be interested in emptying and caring for the container. They should be encouraged to pack their own lunch, relieving their mother of this task.

Food for the lunch box: A well-planned school lunch box should have one or more foods from each of the following lists:

<i>Bread Sandwiches with</i>	<i>Fruit or Vegetables</i>	<i>Sweets</i>
American cheese	Raw fruit—apples, oranges	Baked custard
Ground cheese and bacon fat mixed	Cooked fruit in jelly glass	Cup cakes
Cottage cheese and peanut butter	Baked apple	Cookies
Cottage cheese and chopped pickles	Prunes	Dates
Cold meat in thin slices	Canned fruit	Raisins and nuts
Peanut butter	Raw carrot	Figs
Baked beans	Tomato	Prunes
Bacon	Celery	Sweet sandwiches of jam, jelly, marmalade, dates, prunes
Bacon and cottage cheese	Radishes	
Eggs, hard cooked, chopped, and seasoned	Vegetable salads in glass or jar	
Fish made into a paste and seasoned	Potato chips	
Lettuce or cress		

Wholesome lunches: A ham sandwich, a jelly sandwich, an apple, and a small piece of plain cake.

A cottage cheese sandwich, a brown bread and butter sandwich, an orange, a cooky.

A chicken sandwich, a graham bread and butter sandwich, one-half cup of apple sauce.

A chopped egg sandwich, a bread and butter sandwich, one-half cup of stewed prunes.

A peanut butter sandwich, a jam sandwich, raisins, a cooky.

A chopped meat sandwich, a bread and butter sandwich, one-half cup canned fruit, gingerbread.

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Circular 128

November, 1920

First Aid to the Stockman



EXTENSION SERVICE OF THE COLLEGE OF
AGRICULTURE

THE UNIVERSITY OF WISCONSIN

THIS CIRCULAR TELLS YOU

How good feed, suitable quarters, and plenty of fresh air and water keep animals well.

Pages 3-5

How the common diseases of cattle are caused, what the symptoms are, and how to prevent or cure them.

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How much and what kinds of medicine to give cattle.

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How horses should be fed, watered and cared for.

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How to prevent and treat the common diseases of horses.

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How medicines in liquid, powder, and paste forms are given to horses.

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How ewes should be cared for at lambing time.

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How common diseases of sheep may be recognized and treated.

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How light, cleanliness, and ventilation pay in swine raising.

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How swine should be handled when affected with common diseases.

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How to get additional information regarding the common diseases of livestock.

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First Aid to the Stockman

B. A. BEACH AND F. B. HADLEY

Conditions in Wisconsin for the production of healthy livestock cannot be excelled. The climate, winter and summer, is invigorating. The soil produces a wealth of succulent, nourishing grasses and efficient grains. From its wells and springs come the purest of water. These are the reasons why stockmen appreciate Wisconsin's capacity as a nursery for healthy breeding stock.

Experienced and successful stockmen and veterinarians are certain that a more extended use of the principles of sanitation and proper feeding with less dependence upon cure-alls are the most important factors in keeping livestock healthy and thriving. Drugs never can take the place of good sanitation and good feeding.

But animals do get sick. When they do, they need careful attention. In many cases they will require medicine, and in most circumstances the administration of medicine should be under the direction of a competent veterinarian. He knows the action, uses and doses of medicines and gives them for special purposes.

This bulletin is intended to help you learn something of the more common livestock troubles. Especially is it designed to aid the beginner, if possible, in the greater production of profitable farm animals.

PART I. CATTLE

It pays to keep animals healthy. And to keep animals healthy, it is necessary to give them proper feed, adequate quarters, and an abundant supply of fresh air and water. The very life of our animals depends upon a good supply of fresh air. When it is necessary to stable animals, ventilation is

easiest gained by means of ventilators which take fresh air into the barn and others to conduct the foul air out.

Cows should have plenty of good quality feed. Unless this is provided, attention to other matters will be of no avail. Time spent in a study of the laws governing the scientific feeding of animals is sure to be well repaid.

Nature has generously furnished us with one of the best means of controlling diseases in the form of sunlight. Nearly all disease-producing germs are quickly killed by the rays of the sun. This fact shows why all barns should be built with plenty of windows to admit an abundance of sunshine.

Many successful dairymen and other stockmen find that it pays to remove waste from mangers. They keep all feed boxes clean and sweet by prompt removal of waste and by occasional washing with a liquid disinfectant solution prepared and applied in strict accordance with directions printed on the package.

Clean bedding helps in keeping animals healthy and comfortable. Animals plastered with manure and filth show poor care and a lack of a dry place to lie. A dirty coat of hair provides a favorable breeding place for microbes and animal parasites, while well-bedded, clean animals thrive much better.

While there is a wide difference of opinion as to the best material for floors, every one agrees that frequent application of air slaked lime to the previously scraped floor is very effective in keeping the stable sweet and clean.

Proper drainage of barnyards, paddocks, and open pens also adds to the animal's health. When animals are allowed to wade through or in mud they are much more liable to disease and injury.

Drinking water should be pure and fresh and the supply plentiful. Great care should be taken to guard it from filth of all kinds. The yellow-green scum that appears in troughs during the summer is not, in itself, harmful, but it may catch and hold dangerous microbes. By emptying the water and from time to time thoroughly scrubbing the trough with a five per cent solution of blue vitriol this vegetable growth may be killed.

The pasture should have a shaded place where the cows can find shelter from the hot sun. Cows cannot produce their

maximum milk-flow unless they are comfortable. Leave the cows at pasture until milking time and turn them out as soon afterward as possible, for they will graze to better advantage then. When the pasture is poor, supply supplementary feed. Good corn silage is most economical for this purpose as it is nourishing, succulent, and is relished by cattle.



FIG. 1.—COWS AT PASTURE IN WISCONSIN

To prevent disease among such valuable purebred dairy cattle as these, the progeny of which is worth thousands of dollars, is highly important.

The very common practice of using the pasture as a burying ground or rotting place for the carcasses of animals cannot be too strongly condemned. The best way is to burn carcasses. Burying, however, is safe if a hole at least six feet is dug and the remains are well covered.

No attempt will be made, in the following outline, to suggest treatment for all diseases to which cattle are subject. It is intended, as its subject indicates, only as a first aid to stockmen.

COMMON DISEASES OF CATTLE

NAME, NATURE AND CAUSES	USUAL SYMPTOMS	PREVENTION AND TREATMENT
Abortion. The contagious form is caused by a germ, described as the bacillus of Bang, gaining entrance to and growing in the womb. Abortion due to injuries such as horn thrusts, kicks, falls and the like is rare.	In the later months of pregnancy abortion is announced by swelling of the udder, congestion of the external genital organs, thickening of the milk, and a red-brown vaginal discharge. The calf is dropped before time. Abortion is often followed by retained afterbirth, resulting in inflammation of the womb and sterility.	Remove the aborting cow from the herd to prevent contact with non-infected cattle. Avoid contaminated feed or litter. Remove and burn soiled litter, the calf, and afterbirth. Disinfect stall and manger. Before returning cow to herd, flush daily with 1 per cent common salt solution until all discharges cease. No medicine or treatment has been found which will surely prevent abortion.
Anthrax. A highly contagious disease due to a germ known as the anthrax bacillus entering the body.	High fever, great weakness, and death in a few hours to a day. Occasionally the progress of the disease is slower and the animal may die or recover after 3 to 9 days. In the latter form swellings often occur at various places on the body.	This disease can be prevented by vaccination. A prompt diagnosis is necessary that the balance of the herd may be vaccinated and other precautions taken. Treatment is useless and dangerous, as man is susceptible to the disease.
Blackleg. A germ disease which usually attacks cattle between the ages of 6 months and 2 years.	The appearance of gaseous swellings beneath the skin, usually on the hind-quarters, hence the common name black-quarter. Death soon follows the appearance of these swellings.	Call a veterinarian to make a diagnosis and to prevent further losses by vaccinating the remaining young stock.

Bloat. Caused by the rapid fermentation of such feeds as clover, alfalfa, frozen roots, decayed food. Choke will cause this affection.	The paunch fills with gas, causing a marked swelling high up in the left flank accompanied by difficult breathing and distress. If relief is not given, death may shortly follow.	Accustom cattle to green feeds gradually. Avoid decayed or frozen food of any kind. If caused by choke, relieve the choke. Provide an artificial outlet for gas by means of trocar and canula inserted through the left flank into the paunch.
Bloody Milk. Due to an injury of the udder, improper feeds, overfeeding.	Udder usually hot and painful; blood present in the milk.	Find and remove the cause. Administer 1 pound of glaubers salts dissolved in 2 quarts of warm water.
Bolls. These are also known as abscesses and are caused by pus gathering in the tissues.	A hot, painful swelling which has a tendency to "point" or "head."	Apply a poultice to bring the gathering to a head. When the center is soft, lance, remove contents and syringe out the cavity with 3 per cent carbolic acid solution.
Broken Bones. Usually due to a kick, fall, or other accident.	Commonly a grating sound may be detected when the broken ends rub together. A swelling and pain may also be detected at seat of fracture.	Have a veterinarian apply a properly made cast and give the animal artificial support of some kind so that the bone may "knit."
Cattle Scab. A parasitic disease caused by mange mites.	Great irritation of skin; loss of hair; crusts, scales and sores on the skin; unthriftness. Close examination will reveal the minute mange mites.	As the disease is highly contagious, all suspected cases should be immediately reported to the state veterinarian.
Chapped Teats. Caused by excessive moisture and exposure to cold.	The skin becomes cracked, rough and very sensitive.	Apply hot, saturated boric acid solution twice daily, then rub dry and anoint with vaseline.

NAME, NATURE AND CAUSES	USUAL SYMPTOMS	PREVENTION AND TREATMENT
Choke. The lodging of some foreign object in the throat or gullet.	Droping of saliva; frequent swallowing; great distress; bloating.	Put a clevis in the animal's mouth and attempt to remove the object with the hand. Never try to force the object down into the paunch or break it by external pressure.
Constipation. A condition usually present in fevers. Also caused by faulty feeding.	Stoppage of the bowels, straining, colicky pains, loss of appetite, sluggishness.	Feed less dry, bulky feed; give plenty of water; administer 1 pound glaubers salts. To calves give 2 tablespoons castor oil and rectal injection of warm, soapy water.
Dehorning. Calves may be dehorned when five to seven days old by the humane method shown in the photograph on the cover and described at the right.	The "buttons" or elevations on each side of the calf's head should be located. Older calves have small horns, the covering or "cap" of which must be removed with a knife before applying the caustic.	The hair should be clipped from an area the size of a nickel around the button or horn. Smear vaseline around the clipped area to prevent burning of the surrounding skin, and wrap the caustic stick in paper to protect the fingers. The clipped place is then moistened with water and horn rubbed with a stick of caustic potash until it becomes white, and the skin gets very thin.
Diarrhea or Simple Scours. Caused by irritation of the intestines from improper	Frequent bowel passages of bad odor and thin consistency. If long continued	First find and remove the cause. For calves give 1 to 2 ounces castor oil in $\frac{1}{2}$

feeding, frozen roots, poisons, infectious germs.	the animal becomes thin and lifeless.	pint warm milk. Follow in a few hours with teaspoonful doses three times daily of a mixture of salol, 1 part, and sub-nitrate of bismuth, 2 parts.
Eczema or Itch. A skin disease resulting from overcrowding, overfeeding, damp, filthy, or overheated quarters.	Scales and crusts appear on the skin; the hair comes out in patches; pustules sometimes form.	Remove the cause; wash affected parts once every other day with a warm saturated solution of boric acid.
Eversion of the Womb or "Casting the Withers." This is a most serious accident which results from excessive straining after calving.	The womb turns inside out and protrudes from the vagina as a pear-shaped, red mass.	Protect protruding parts with a clean sheet. Cleanse them with a warm solution of common salt and water. As experience is needed to return the parts, this operation should be left to a veterinarian.
Foul Foot and Foot Rot. Wedging of filth between the claws. Often occurs from the claws becoming too long from close stabling.	Lameness, heat and swelling above the hoof, foul odor and pus accumulations beneath the horn.	To prevent, keep the feet clean and provide exercise. Soak feet in a 2 per cent coal tar disinfectant. If pus has burrowed beneath the horn, trim away overlying horn to allow drainage.
Garget or Inflammation of the Udder. Commonly caused by germs gaining entrance to the udder; also follows injuries.	Milk becomes stringy and bloody; udder becomes hard and sensitive; lameness develops; loss of appetite occurs. In severe cases the cow develops a fever.	Milk affected cows last. Thoroughly disinfect hands or teat cups before milking normal cows; give a laxative ration; do not permit the udder to become chilled by coming in contact with cold concrete. Apply woollen rags wrung from hot water. Rub udder with unsalted lard or cottonseed oil.

COMMON DISEASES OF CATTLE—Continued.

NAME, NATURE AND CAUSES	USUAL SYMPTOMS	PREVENTION AND TREATMENT
Goiter. Enlargement of the thyroid gland located in upper part of neck. Cause often obscure; may be deficiency in ration or high protein ration, or inherited.	A swelling in the neck accompanied by labored breathing in advanced cases due to pressure on the windpipe.	Change of feed and exercise will be found helpful in bringing about recovery in young animals. If the swelling persists paint with tincture of iodine.
Impaction. Overfilling of one or more compartments of the stomach with dry feed.	Loss of appetite, stopping of the milk-flow, cud chewing irregular. Pressure in the left flank reveals a doughy mass.	Withhold all feed; give 1 to 2 ounces of aromatic spirits of ammonia. In a few hours give $1\frac{1}{2}$ pounds glaubers salts in a gallon of water.
Indigestion. Caused by poor quality or improper quantity of feed, or by irregular feeding.	General depression, loss of appetite, suppression of the milk flow, more or less bloating, poor condition. Often termed "lost cud."	Remove cause, that is, withhold all feed. Give $\frac{1}{2}$ to 1 pound glaubers salts. After 12 to 24 hours offer animal succulent feed. If no improvement call veterinarian to prescribe medicine.
Johnes's Disease or Chronic Bacterial Dysentery. A chronic disease caused by a specific germ, which grows in the intestinal walls and adjacent lymph glands.	Diarrhea is usually the first symptom. This disappears only to appear at intervals for months and sometimes years. The animal becomes gradually thinner until almost a skeleton. Death finally results.	Avoid bringing in cattle from infected herds. See that feed does not become contaminated with feces from a diseased animal. There is no treatment. Call a veterinarian to apply the Johnin test and detect the diseased cattle, which must be taken from the herd.

Lousiness. The blood-sucking "blue louse," and the biting "little red louse" are the most common causes.	Rubbing due to constant irritation of the skin; loss of hair; scurfy appearance of skin.	If dipping or spraying with a coal tar disinfectant solution prepared according to the directions of manufacturer does not help, try the methods of treatment given in Farmers' Bulletin 909, issued by the United States Department of Agriculture, Washington, D. C.
Lumpy Jaw. A non-contagious disease caused by a specific germ gaining entrance to the tissues.	Swelling on side of face, or jaw, which may become so extensive as to interfere with chewing.	The giving of iodine both externally and internally under the direction of a veterinarian.
Milk Fever. Occurs only in cows in good condition and shortly after calving, as a rule.	Paralysis which is more or less sudden, collapse, loss of consciousness. The head rests in right flank.	Immediately fill the udder with air, taking care not to introduce infection. Never drench a cow suffering from milk fever, as the throat is paralyzed and she cannot swallow.
Milk Fistula or Leaky Teat. An opening in the side of the teat usually caused by an injury.	Milk leaks through the hole moistening the milker's hands and making it impossible to get a clean product.	When the cow goes dry call a veterinarian to freshen the margins of the hole with a thermocautery and to draw the wound together with tape.
Paralysis. Causes often obscure; may be due to injuries to nerves.	Loss of the use of one or more parts of the body from inability of muscles to act.	The cause must be found and removed. This requires a veterinarian.
Pericarditis or Inflammation of the Heart Sac. Caused by a foreign body piercing the wall of the second stomach, diaphragm, and heart sac, thus introducing pus germs.	Fever, loss of appetite, rapid pulse, swellings along the belly, coughing when exercised, turning out of elbows.	Keep nails, wire, and other foreign bodies out of reach. Once the body becomes firmly imbedded it cannot be removed except by an operation performed through the flank.

COMMON DISEASES OF CATTLE—Continued.

NAME, NATURE AND CAUSES	USUAL SYMPTOMS	PREVENTION AND TREATMENT
Pneumonia or Inflammation of the Lungs. Exposure; other diseases; foreign substances in the lungs.	Fever, loss of appetite, cough, rapid breathing, nasal discharge.	A good nurse is of more value than drugs, although they are needed to support the heart.
Rabies or Hydrophobia. Caused by a virus transmitted through the bite of a mad dog.	Cattle become greatly excited, froth at the mouth, and show signs of viciousness. The disease is fatal.	Control stray dogs. Medicinal treatment useless. Confine all sick and exposed animals until released at a veterinarian's order.
Retention of the Afterbirth. Often follows abortion. May occur as result of weakness due to improper feeding and care.	A foul-smelling discharge with fragments of the membranes comes from the cow. Unless relief is given, fever, loss of appetite, suppression of the milk flow, and rapid emaciation soon follow.	Give the cow warm water to drink and call a skilled veterinarian to remove the membranes and flush the womb with warm salt and water.
Ringworm. A contagious disease of the skin, caused by a vegetable parasite.	Circular patches covered with a crust occur about the head, neck and shoulders; the hair falls out; intense itching is often exhibited.	Isolate affected animals; remove crusts with soap and water; apply tincture of iodine; whitewash stable.
Sore Eyes. Caused by bruises, chaff, hayseed and other foreign bodies getting into the eye.	Swelling and closure of the eyelids, profuse flow of tears, pus accumulation. Later the eye becomes white like china and blindness results.	Remove the cause. Place the animal in a darkened stall and bathe the eye with a clean, warm saturated boric acid solution three or four times daily.

Teat Obstructions. Warty growths or constrictions due to injuries.	The presence in the teat canal of a constriction or growth blocking the milk flow.	A veterinarian can operate and relieve the condition. Sometimes a teat-plug will give relief.
Tuberculosis. Caused by a specific germ, the bacillus of tuberculosis.	No outward symptoms in cases just beginning but emaciation, chronic diarrhea, coughing, rough coat in advanced cases.	Have suspected cattle given the tuberculin test and dispose of all reacting animals according to the directions of the state veterinarian.
Warbles or Grubs in the Back. The warble fly lays eggs about the feet of cattle. These are taken into the mouth where they hatch and migrate to tissues beneath the skin of the back.	In the late fall and winter lumps containing the grubs are found under the skin of the back.	Remove large grubs by pressing the mouth of a bottle over the hole in the skin, or kill them by injecting a few drops of tincture of iodine through the hole.
Warts. These may appear anywhere on the body, especially on the teats.	Warts are a nuisance but their presence does not interfere with the animal's health.	May be removed by softening with oil, then twisting off the growth or snipping it off with scissors. Paint with tincture of iodine if they appear again.
White Scours or Infectious Diarrhea. A disease of new-born calves caused by the entrance of germs into the bowels. Stabling in unclean quarters is a contributing cause.	Thin, light-colored, stinking bowel discharges; great weakness. Rapid death if not relieved.	Clean and disinfect stable and utensils. The injection of white scours serum is the only effective preventive.

GIVING MEDICINE TO CATTLE

Small doses of medicine may be mixed with the feed or drink. When prompt action is needed, cattle may be drenched. If the medicine is in the dry state, dissolve it in water, and place the solution in a long-necked bottle. Raise the animal's head so that the fluid will run down the gullet of its own accord. Carefully insert the neck of the bottle in the center of the mouth. When the bottle is half-way back on the tongue, allow the contents to run slowly from the bottle. Stop frequently to allow the animal to swallow. If the animal coughs, remove the bottle at once to prevent fluid getting into the windpipe.

PART II. HORSES

Improper feeding is probably the cause of more horse troubles than any other one thing. The inexperienced may find profit in observing the few "dont's" in the following paragraphs.

Feed well. Full feeding is not wasteful. Horses are kept for power and full feeding insures maximum efficiency. Foals, especially, should be well fed. In the first year of life a foal makes one-half or more of its growth. Therefore, feed so that the draft foal will weigh 900 to 1,000 pounds when a year old.

Exercise idle work horses and cut down their feed. Azoturia is almost sure to result if horses accustomed to daily work are idle for two or three days in succession on full feed.

Avoid abrupt changes of the grain feed, and especially avoid green oats and all improperly cured grains. Colic, the most common horse trouble, can usually be traced to sudden changes in the kind or amount of feeds.

All hay fed to horses should be well-cured and free from dust and molds. Give relatively less hay, as most farm horses are fed too much of this roughage. While a limited quantity of sound silage may be fed horses, hard-worked horses should not be fed it.

Very warm horses should not be allowed to drink their fill of cold water nor should they be given grain until they have cooled off somewhat.



FIG. 2.—PROMPT TREATMENT PREVENTS TROUBLE

Unless small shoulder galls are attended to early they may become serious.

COMMON DISEASES OF HORSES

NAME, NATURE AND CAUSES	USUAL SYMPTOMS	PREVENTION AND TREATMENT
Abortion. Results from accidents or any disease or condition that interferes with the nutrition of the fetus. At times the disease becomes contagious.	A discharge usually precedes premature birth of the fetus, which is either born dead or so weak that it fails to thrive.	Avoid rye straw and other feed containing smut (ergot). If the afterbirth does not come away promptly, call a veterinarian to remove it.
Azoturia. Occurs in horses in the prime of life, if exercised freely after a few days' rest on full feed.	Sudden lameness and profuse sweating are first symptoms. The animal falls and is unable to arise, although making desperate efforts. The urine is retained and is coffee colored.	Give daily exercise of some kind; on idle days reduce grain feed and give laxative ration. When first symptoms appear, stop and blanket the horse at once. Send for a veterinarian to prescribe treatment.
Bots. Commonly called grub in the stomach. The bots are attached to the lining membrane of the stomach and develop from eggs laid by a fly on the hairs of the legs.	Most horses harbor some bots. The presence of a great many cause indigestion. A few are relatively harmless.	Carbon bisulfide is a reliable remedy to expel bots. It is given in doses of 4 or 5 drams in a gelatin capsule.
Canker of Foot. A germ disease of the sole and frog more likely to occur when feet are not kept clean.	Foul odor, undermined horn, pus discharge, discoloration of horn, lameness.	Clean the foot, trim away all diseased horn, pack with tincture of iodine or pine tar and oakum. Redress every second day with fresh dressing and bandage.
Colic. Commonly known as "belly ache" usually occurs from improper feeding.	Stamping, pawing, attempts to lie down, violent throwing, sweating and straining	This disease may be prevented by feeding proper amounts at regular intervals.

ing, also from horse drinking large amounts of cold water when he is hot or has been exposed to drafts.	and turning head to flank,—all due to acute pain in some abdominal organ.	Avoid green oats and other improperly cured grains. In mild cases the giving of $\frac{1}{2}$ pound epsom salts or 1 pint of raw linseed oil is helpful. If pain is severe, call a veterinarian to diagnose the kind of colic and to give appropriate treatment.
Distemper or Strangles. A disease primarily of young horses caused by a germ.	Sluggishness, diminished appetite, thirst and cough. After a few days a nasal discharge. A swelling may appear on the underside of the jaw. This will develop into an abscess.	Keep infected horses isolated; give laxative feed; when swellings appear, have them lanced and the abscess cavities syringed with a disinfectant solution.
Glanders or Farcy. A very fatal contagious disease of horses and mules caused by a germ known as the <i>Bacillus mallei</i>.	In skin glanders or farcy small swellings appear in the skin. These finally rupture and discharge. A nasal discharge is frequently seen in all forms. Loss of weight and general debility occur in latter stages.	Treatment is never warranted, but an early diagnosis is imperative to avoid spreading the disease. On application to the state veterinarian suspicious cases will be tested in order to detect the disease and apply preventive measures.
Heat Stroke. Excessive work in great heat, especially if horse is not used to it or has had a previous attack of the disease.	Suddenly the horse lags, hangs his head, staggers and falls. Rapid breathing, pulse very fast, temperature greatly elevated may be noted. Animal does not sweat.	To prevent heat stroke, work horses judiciously, especially the first hot days of the season. To treat apply ice or cold water to head and body; give rectal injections of cold water. A veterinarian would prescribe sweet spirits of niter or aromatic spirits of ammonia to support the heart.

COMMON DISEASES OF HORSES—Continued.

NAME, NATURE AND CAUSES	USUAL SYMPTOMS	PREVENTION AND TREATMENT
Heaves. A condition of chronic forced breathing, usually due to improper feeding.	Difficult breathing, hollow coughing, evacuation of gas, "heave line" in flank. No fever or loss of appetite.	Feed hay sparingly and only when moistened. Increase the grain ration. Use shavings or sawdust for bedding. Give $\frac{1}{2}$ ounce Fowler's solution to each feed.
Hydrophobia or Rabies. Caused by the bite of a rabid animal, usually a dog.	Increased excitability, viciousness, biting the wound, paralysis and death in a few days.	Enforcement of a dog-muzzling law would largely prevent rabies. Treatment is too expensive to justify its use except for valuable animals.
Influenza, Pink Eye or Shipping Fever. A prevalent highly contagious disease caused by a specific infection.	Five to seven days after exposure a high fever develops followed by dullness, loss of appetite, rapid breathing, swollen red eyes, profuse flow of tears, staggering gait, stocking of the legs and swelling along the belly.	As the disease may result fatally, a veterinarian should be put in charge. He will apply the needed treatment and, if his judgment so directs, use a bacterin to prevent other horses from getting the disease.
Intestinal Catarrh. Frequently seen in old horses, especially those allowed to eat frozen or decayed feed.	A persistent diarrhea with loss of flesh. The feces are often coated with mucus.	Remove the cause and feed a proper ration. Give one pint of raw linseed oil. Keep on dry feed until recovery. Artificial caltsbad salts in tablespoonful doses three times a day are very helpful.

Intestinal Parasites. The horse harbors various kinds of parasites; round worms are most common.	Unthriftiness, loss of flesh and disordered bowel movements are possible symptoms. In the spring months the worms and their eggs may be found in the droppings.	The elimination of these worms depends on the giving of poisonous worm expellers and should not be done except by a veterinarian.
Joint Ill or Navel Disease of Foals. Occurs in newborn foals from the entrance of germs by way of the navel.	A swelling of the joints accompanied by great pain, loss of appetite, and prostration.	Provide a clean stall for the mare at foaling time. Dip the stump of the navel cord in tincture of iodine immediately after birth. Medicines to sustain the heart and control digestive disorders must be provided.
Laminitis or Founder. Congestion of blood beneath hoofs caused by sudden change of diet, overfeeding, excessive drinking of cold water when animal is hot, injuries which throw the weight on one foot.	Stiffness; intense pain in front feet; hind feet placed well forward to take weight from front feet. Horse will not back nor lie down. In chronic cases the sole drops and the wall of the hoof grows in a peculiar way.	Avoid sudden change of feed. Do not give feed or water when a horse is hot. Give 2 ounces of alum in capsule every 2 hours until 8 ounces are given; apply ice or cold water to the feet. Remove shoes.
Lockjaw or Tetanus. An affection of the nerves caused by a germ which gains entrance through a wound.	Stilted gait, difficulty in chewing, appearance of a membrane over the inner part of the eye, increased excitability, rigidity of groups of muscles, particularly in the tail.	All nail pricks and wounds of the feet should be opened and disinfected, a veterinarian should inject tetanus antitoxin. Keep patient quiet and stable dark.
Lymphangitis or "Big Leg." One hind leg suddenly becomes greatly swollen. The cause may often be traced to a small wound which has become infected, or to overfeeding.	Rise in temperature, lameness, painful swelling of leg. Inside of thigh is very sensitive to pressure.	Provide laxative feed for horses subject to attacks. Give 1 pint of raw linseed oil. Apply hot fomentations to the affected leg. Give a teaspoonful of saltpeter three times daily in drinking water.

COMMON DISEASES OF HORSES—Continued.

NAME, NATURE AND CAUSES	USUAL SYMPTOMS	PREVENTION AND TREATMENT
Mange. A disease of the skin caused by mange mites which are so small that a microscope is needed to identify them.	Constant itching and rubbing, loss of hair over affected parts, formation of scabs.	As this is a highly contagious disease, cases should be quarantined and reported to the state veterinarian, who will advise as to methods of treatment and prevention.
Pneumonia or Lung Fever. An affection of the lungs due to exposure to cold damp quarters, and irritating substances such as dust, smoke, and germs.	Difficult breathing, fever, dullness, chills, stocking of the legs, nasal discharge.	Because there are several different kinds of pneumonia, each requiring different treatment, it is impossible to give specific directions. However, the animal must be kept quiet, warm, and comfortable and given access to fresh air at all times.
Rabies (See Hydrophobia).		
Strangles (see Distemper).		

GIVING MEDICINE TO HORSES

The usual forms in which medicines are administered to horses by the owner are liquids, powders, and pastes.

Liquid medicines are given as a drench by means of a taper-necked bottle or a dose syringe. Care should be taken that the liquid does not "go down the wrong way" into the wind pipe and lungs, where it would strangle the animal and might cause pneumonia.

Powders are administered in the feed or drink if they are tasteless. Strong-tasting medicines offered in this manner will be refused, so other means of administration must be sought.

Pastes are preparations of medicines usually made up with syrup as a base. They are known as electuaries. The mixture is given by smearing it on the teeth or tongue.

Veterinarians often give medicines in the form of balls or pills which are placed on the back of the tongue by the fingers or a balling gun. A gelatin capsule is the most satisfactory covering for this form of medication. The capsule is also useful in giving liquid and powdered drugs. Hypodermic tablets are used when the medicine is in condensed form, readily soluble, and free from germs. A special hypodermic syringe fitted with a hollow-pointed needle that can be sterilized in boiling water is used to introduce medicines under the skin.

PART III. SHEEP

Although sheep are subject to fewer infectious diseases than other farm animals, they are the prey of numerous parasites which exact a heavy toll. The one season of the year in which losses are likely to be somewhat heavy, unless proper care is taken, is at lambing time, the season of the "the shepherd's harvest."

Careful and experienced shepherds have contributed to the following paragraphs covering this phase of the sheep grower's activities. The beginner may find helpful suggestions among them:

Keep ewes about to lamb away from other stock. Provide warm, well-bedded quarters, exposed to the sun, allowing 12 to 16 square feet of space to an ewe. It is desirable to provide lambing pens for ewes whenever possible. These should be 4 by 4 feet or 4 by 6 feet. Both ewe and lamb should be kept in the lambing pen until the lamb is two or three days old.

Shear all dirty wool from around the udder.

Have near at hand the supplies named below; you may need some of them in a hurry:

Liquid sheep dip for disinfectant, epsom salts, castor oil, tincture of iodine, vaseline, nipples and nursing bottle, a metal syringe with a large and a small nozzle to be used in giving injections to ewes and lambs, a glass graduate to measure medicines.



FIG. 3.—DRENCHING A SHEEP

Care must be exercised in giving medicine by way of the mouth.

A few days before she is due to lamb, pen the ewe in the place reserved for lambing quarters. Be careful about crowding at the doors or feed racks. Closely watch the flock day and night. Indications of lambing are: the ewe lies down and gets up frequently; she is sunken in front of the hips; she refuses food, and hunts for a quiet place in which to lie.

Do not disturb the ewe as long as everything goes well, for under normal conditions she will deliver the lamb without help. If she needs help, first see that the lamb is in proper position. Normal presentation is fore feet first with head

lying snugly upon the feet. However, a lamb often comes with the hind feet first. When necessary to aid, wash the hand and arm well in a disinfectant solution, pare the nails, and smear with vaseline. Place the ewe on her side and enter the hand gently. If the lamb does not lie in proper position, turn it as best you can and pull gently downward while the ewe labors. Be certain to keep the head coming with the fore feet. Take great care not to tear the parts of the ewe. An ewe torn inwardly or failing fully to expel the afterbirth should be syringed with liquid dip, 1 part dip to 100 parts of water.

For several days after the lamb is born give the ewe close attention. Note the condition of her bowels. Give her all the cool water she wants to drink. Keep her out of cold drafts. Milk her out if the lamb does not take all of the milk. Give her good feed, such as clover or alfalfa hay, but very little grain for two or three days unless she is very thin.

She may refuse to eat for three to six hours after lambing. If she still refuses after this time give her a physic consisting of 4 or 5 ounces of epsom salts dissolved in warm water.

If the udder is swollen, milk it out and paint it twice a day with iodine until the swelling decreases. Then paint it once a day until normal. Sores sometimes form on the teats. These may be caused by blisters or by the sharp teeth of the lamb. If the sores fester, lance them and wash twice daily with a solution of dip made by diluting 1 part of dip in 25 parts of water. If sharp teeth cause the sores, the lamb may have to be taken away. Mothers refusing to let the lamb nurse must be milked out.

Soon after the lamb is born, start the milk from each teat. A strong lamb will quickly find the teat and begin to nurse, but if a lamb is too weak to nurse place it in position to reach the teat and rub its back lightly. If it then refuses to nurse pour milk down its throat with a spoon until it can feed itself. If the mother has no milk, let the lamb nurse another ewe. When necessary, feed cow's whole milk, two tablespoons every two hours, heated to 90° F. in a bottle placed in hot water.

A chilled lamb should be immersed in a tub of blood-warm water and immediately afterward well dried by giving it a thorough rubbing with woolen cloths. Feed it, wrap it warmly, but with the nose exposed, and put it in a warm place until it is vigorous and lively. Do not keep it away from its mother longer than necessary.

COMMON DISEASES OF SHEEP

NAME, NATURE AND CAUSES	USUAL SYMPTOMS	PREVENTION AND TREATMENT
Abortion. Premature birth of lambs due to injuries, smutty or decayed food, contagion.	Often a discharge may be observed a few days before the ewe aborts.	Provide suitable feed. Have all doorways wide and see that sills and other obstructions which ewes must pass over, are low. For contagious abortion consult a veterinarian.
Abscesses. These are also known as boils and result from injuries to the tissues.	The presence of a hot, painful swelling which has a tendency to "point" or "head."	Lance the swelling to remove the contents. Avoid cutting large blood vessels. Syringe out cavity with a disinfectant solution.
Bloat. Rapid fermentation in the stomach of such feeds as clover, alfalfa, and rape. The gas thus formed is retained and causes trouble.	Distention of the paunch which may become great enough to burst the walls, press upon the lungs and cause death.	Turn sheep to pasture only when well filled with dry feed. A bloated sheep may be relieved by the use of a trocar and canula to remove gas. In mild cases drench with a quart of fresh, warm cow's milk.
Catarrh. This affection is often known as a cold and is caused by exposure.	Discharge from eyes and nose, labored breathing, slight fever, lack of appetite, and coughing. Sheep are said to have the "sniffles."	As this disease is the direct result of exposure, prevention consists in providing adequate quarters and a laxative ration. When due to grubs in the head follow suggestions given for them.

Constipation. Stoppage of the bowels due to improper rations and lack of exercise.	Uneasiness, stretching, loss of appetite. Bowel movements nearly or entirely cease.	Administer 4 to 8 ounces of raw linseed oil with $\frac{1}{2}$ to 1 ounce of turpentine to mature sheep. Rectal injections of warm soapy water also aid. Feed roots and induce exercise.
Diarrhea. Same as in cattle.	Frequent bowel passages of liquid consistency. If of long standing the animal becomes weak and lifeless.	First take away all feed, then give 1 to 3 ounces of castor oil to clean out the bowels. Follow in 12 hours with $\frac{1}{4}$ teaspoon doses of the medicine prescribed for diarrhea in calves.
Eversion of Womb. In this condition the womb turns wrong side out and protrudes from the vagina. It is likely to follow excessive straining from any cause.	A red mass protruding from the vulva. Frequent and violent straining.	Not advisable for the inexperienced to attempt replacement if the ewe is valuable. Call a veterinarian.
Foot Rot. A disease of the feet of sheep pastured or fed on wet ground. It sometimes appears without apparent cause.	Severe lameness, discharge of pus from hoof, bad odor about feet.	Change flock to dry soil. Remove diseased tissue and discolored horn. Soak feet in solution of 1 ounce copper sulfate to $1\frac{1}{2}$ quarts of water.
Garget. This is inflammation of the udder due to bruises from the head of the lamb, lying in damp or cold quarters, or heavy feeding of concentrates.	Dark-red or purple discoloration of udder; refusal to let lamb nurse; loss of appetite; if neglected gangrene and sloughing of affected parts.	Give 3 ounces of epsom salts in warm water. Milk out contents of udder frequently. Bathe with hot water several times daily. Lubricate with a mixture of 2 tablespoonfuls of turpentine in 1 pound of vaseline.

COMMON DISEASES OF SHEEP—Continued

NAME, NATURE AND CAUSES	USUAL SYMPTOMS	PREVENTION AND TREATMENT
Goiter. A swelling of the thyroid gland in the neck. It may be hereditary or caused by a high-protein ration.	The swelling on the neck is the most noticeable symptom. Goitered lambs are usually weak or are born dead. In pronounced cases breathing is interfered with.	Correct the ration if it is at fault. Do not breed from goitered stock. Paint enlargement with tincture of iodine and give 5 to 10 grains of potassium iodide daily for 10 days.
Gravel. This is a deposit of lime salts in bladder or urethra. Rams and wethers only are affected.	Animal lies down a good deal or lags when driven. A peculiar jerking movement is seen when animal is standing; constant straining to urinate, but only small amounts of urine are voided.	Feed sugar beets and mangles sparingly. Clip wool from around the end of the prepuce. Flush latter with olive oil. If stoppage is back of curve, the chances of recovery are poor.
Grub-in-head. Larvae of the sheep gad-fly infest the nasal cavities and sinuses.	Sheep hangs head, and butts fence or walls. A greenish, slimy discharge from the nose may be observed.	Salt sheep in troughs with narrow openings around which tar has been smeared. Treatment is not recommended.
Indigestion. Any digestive disturbance caused by sudden changes of feed, frozen feeds, and spoiled feeds.	Sheep stop chewing the cud; they bloat, stretch, and show other evidences of abdominal pain.	Give in $\frac{1}{2}$ pint of warm water one teaspoonful each of sweet spirits of niter and ginger and two teaspoonfuls of baking soda. Follow in 12 hours with a dose of castor oil.

Maggots. Grubs hatching from the eggs of the blow fly burrow into the flesh beneath dirty wool at the rear of sheep.	Twisting about and biting infected spots. Inspection will reveal the maggots.	Cut off filthy wool and clean wound with 1-50 coal tar disinfectant. Smear pine tar over raw spots. Do not use turpentine as it is too irritating.
Pneumonia. Inflammation of the lungs often caused by confining sheep when wet in a tightly closed barn or shed where they sweat and steam. Lung worms may also cause pneumonia.	Labored breathing, discharge from eyes and nose, fever, scanty flow of urine, dry muzzle, coughing.	See that the quarters are comfortable, then call a veterinarian to separate the sick from the well sheep and to prescribe medicinal treatment.
Scab. A serious skin disease caused by a mange mite and introduced by infested sheep or from infested quarters.	The most pronounced symptom is intense skin irritation. Red spots from which serum oozes appear on skin and rapidly increase in size. Crusts and scabs form and wool falls out in patches. Infested sheep fail to thrive.	As this disease is highly contagious, outbreaks should be reported to the state veterinarian at once. A lime-sulphur dip is the only satisfactory method of treatment. Infested flocks should be quarantined.
Sheep Ticks. These are the most common external parasite of sheep.	Besides the irritation resulting, the fleece shows damage from rubbing against brush, etc.	Dipping vats should be made and the sheep dipped after shearing. Use any of the standard dips according to directions on the package.
Sore Teats. An inflamed, swollen, and bleeding condition of the teats due to damp, cold quarters or to lambs biting the teats.	Ewe refuses to nurse the lamb on account of the resulting pain.	Carefully anoint with carbolated vaseline once daily.

COMMON DISEASES OF SHEEP—Continued

NAME, NATURE AND CAUSES	USUAL SYMPTOMS	PREVENTION AND TREATMENT
Stomach Worms. Sheep pasturing on infested pasture swallow newly hatched worms which develop in the stomach.	Loss of appetite; thirst; diarrhea; pale membranes, seen especially in the eye. The symptoms are usually not noticeable in well-kept flocks. Lambs suffer most.	Change or rotate pasture every two or three weeks. Dissolve 2 ounces of finely powdered bluestone in 1 gallon of warm water. For lambs 3 to 6 months old, give as a drench 1 to 1½ ounces; 6 to 12 months old, 1½ to 2½ ounces; adult sheep, up to 3½ ounces.
Tapeworms. Several varieties are found in the intestines. Sheep become infested by taking into their digestive system segments of worms from other sheep.	Paleness of skin and membranes; diarrhea; segmented worms occur in droppings; rapid loss of weight; appetite good.	For adult sheep, after 24 hours fasting, dose with kamala powder, 2 drams, in gruel, and follow in 24 hours with 3 ounces castor oil. Confine sheep during treatment.

GIVING MEDICINE TO SHEEP

Medicine is usually administered to sheep as a drench. Though sheep are not difficult to drench, some precautions are necessary. Select a bottle with a long neck and a small mouth. Back the sheep into a corner and hold it as shown in figure 3. Introduce the bottle and induce the sheep to chew by working the bottle back and forth. While the sheep is chewing allow the medicine to run slowly from the bottle. Do not hold the sheep's head too high.

PART IV. SWINE

Contrary to popular opinion, the hog is naturally a clean animal. In far too many cases he does not have the chance

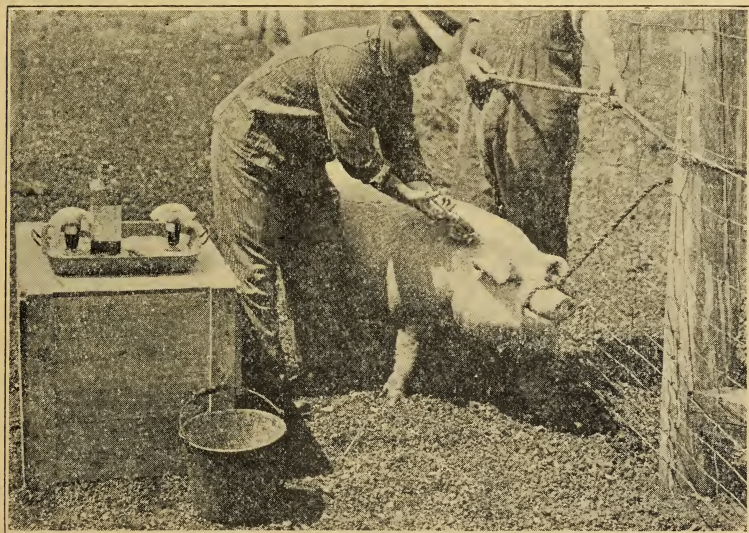


FIG. 4.—VACCINATING A LARGE HOG

The hog is snubbed to a post and the hog cholera serum injected under the skin behind the ear. This is the only effective method of preventing hog cholera.

to keep himself clean, but when given the chance he is quick to avail himself of the opportunity. Light, cleanliness, and ventilation will be found to pay just as big profits in swine production as in any other branch of the livestock business.

Provide warm, dry, well-ventilated hog houses. Colony houses are cheap and good. Keep floors and bedding clean. Disinfect occasionally. Dip to prevent lice. Vaccinate to prevent hog cholera. Use the mixtures recommended to prevent worms. An ounce of prevention is worth a pound of cure.

COMMON DISEASES OF SWINE

NAME, NATURE AND CAUSES	USUAL SYMPTOMS	PREVENTION AND TREATMENT
Abortion. The premature birth of the fetus, due to frozen or moldy feed, injuries, germ infection.	A discharge often precedes by a few days the expulsion of the fetal pigs before they are fully developed.	By eliminating narrow doors and low sills over which sows must climb abortions due to injury may be prevented. When due to infection the same plan should be followed as for abortion in cows.
Bronchitis. This is an inflammation of the lining of the bronchial tubes. Actual causes are dust, germs and worms. Contributing causes are damp, dark pens and nesting in wet litter.	Persistent coughing, unthriftiness, slight fever.	Provide sanitary quarters and increase the ration. Young pigs should be fed milk. Medicines to dislodge the worms are dangerous unless given by a competent person.
Cannibalism in Sows. A bad habit or a lack of some needed element in the feed.	Sows eat the pigs soon after they are born.	If one sow starts, feed all sows animal matter, such as tankage. It is rarely advisable to keep such sows for breeding purposes.
Farrowing Fever or Inflammation of the Womb. Caused by unskillful assistance at farrowing time, retention of afterbirth, or a decomposing pig.	Depression, loss of appetite, foul-smelling discharge, swollen vulva, muscular weakness.	Force pregnant sows to exercise. Do not overfeed. Provide clean, dry places for farrowing. When assisting a sow at farrowing be careful not to carry infection into the womb nor to tear the tissues by manipulation.

Garget or Caked Udder. A diseased condition of the udder caused by injuries of various kinds, cold and damp quarters, or injudicious feeding.	Udder hot and painful, milk flow suppressed, sow refuses to nurse pigs, general debility.	Fill hollows in front of doors to prevent injury of udder on door sill. Administer 1 to 2 tablespoonfuls castor oil. Apply hot applications to udder; keep it well lubricated with vaseline.
Hairless Pigs. A diseased condition in which pigs are born with little or no hair. It is associated with goiter in sows.	Pigs are born without hair or are scantily haired, and have thin, brittle hoofs, and goiter. They always die sooner or later.	To prevent the trouble give the sow during the last 60 days of the gestation period $\frac{1}{3}$ to $\frac{1}{6}$ ounce of potassium iodine to each 100 pounds of feed. The liberal feeding of roughage during the winter is also a preventive.
Hog Cholera. An extremely contagious disease caused by a germ so small it cannot be seen with a high-power microscope.	Loss of appetite, fever, coughing, stiffness, red skin, discharge from eyes, constipation followed by diarrhea. Usually death occurs in a few days.	Call a veterinarian to make sure of the diagnosis and to vaccinate with hog cholera serum, which is the only preventive known.
Indigestion. A digestive disorder caused by improper feeding.	Loss of appetite, slight fever, constipation or diarrhea, hollow flanks, gaunt appearance.	Make a complete change of feed. Slop the hogs for a few days, then give in the slop 1 tablespoonful epsom salts to each 100 pounds live weight.
Intestinal Worms. Several varieties of worms are found in the intestines, but the most common is the large round worm or <i>Ascaris suis</i>.	Scouring, loss of flesh, dry skin, drooping ears, weakness, slight fever, and failure to gain are usual symptoms.	To prevent, see suggestions for Lung Worms. Withhold feed for 12 hours then give worm mixture of santonin $2\frac{1}{2}$ grains, areca nut 1 dram, calomel $1\frac{1}{2}$ grains, sodium bicarbonate $\frac{1}{2}$ dram. This is the dose for a 100 pound pig.

COMMON DISEASES OF SWINE—Continued

NAME, NATURE AND CAUSES	USUAL SYMPTOMS	PREVENTION AND TREATMENT
Lousiness. Caused by the common hog louse, a blood-sucking parasite.	Constant irritation of the skin. If condition is severe, the pig becomes unthrifty and the skin scurfy.	Dip in 2 per cent coal tar solution or apply crude petroleum to the back and sides of affected animals. Hog oilers are helpful.
Lung Worms. These are a reddish thread-like worm $\frac{1}{2}$ to 1 inch long, which are parasitic in the lungs. Usually pigs only are infected.	Violent coughing, nasal discharge, unthriftness, symptoms similar to pneumonia, which often develops.	No treatment has been found effective, so care should be taken to prevent pigs becoming infected. Since the worms are hatched from eggs discharged by worms harbored by infested pigs, preventive measures consist in keeping young pigs away from older pigs.
Mange. A skin affection caused by the mange mite burrowing into the skin.	Itching, scurfy condition of the skin especially under the arm, inside thigh, behind ears and upon back.	Apply a standard coal tar dip with a scrubbing brush. Then anoint the skin with a bland oil like cottonseed.
Necrotic Enteritis. A germ disease in which the lining of the bowels becomes rotted.	The symptoms resemble those of hog cholera, to which reference should be made.	See directions for sore-mouth, a disease caused by a similar germ infection.
Paralysis. A loss of nervous control over the muscles. Cause often obscure.	In shots the onset is gradual and the gait is wobbly. In sows, it appears suddenly.	Since the feed may be responsible, growing swine should not be fed wholly on

Kidney worms have been found in some cases.	suddenly and they are deprived of the use of the hind limbs.	corn. As medicinal treatment is not satisfactory it is best to butcher hogs in good condition as soon as possible.
Piles. A protrusion of the rectum caused by constipation or inflammation of the rectum.	Constant straining resulting in the appearance of a red, bleeding membrane at the anus.	Remedy the constipation by feeding laxative feeds. Dust protruding part with powdered alum and lime. In severe cases a surgical operation is necessary to relieve the trouble.
Pneumonia. A congestion of the lungs resulting from lying in damp, cold quarters, or from overheating followed by exposure or germs.	Labored breathing, fever, general debility, coughing spasms, nasal discharge, loss of appetite.	Prevent hogs from nesting in damp litter; provide dry bedding, and shelter free from draughts. Since the disease is likely to result in death, the best medical attention obtainable should be sought.
Poisoning. This is due to eating lead, arsenic, spoiled feed, common salt, or lye.	Abdominal pain and sudden death; or lingering illness with diarrhea are common symptoms.	Make a complete change of feed. Give a purge of 1 tablespoon epsom salts for each 100 pounds live weight. If poison is known give appropriate antidote.
Rheumatism. An affection of the muscles due to damp quarters, lying on cement floors, or undue exposure.	Intermittent lameness, inability to walk, muscular soreness, sometimes fever, swollen joints.	Dry, roomy quarters to prevent overcrowding are essential. Cement floors should be well covered with bedding or plank. Medical treatment consists of daily doses of 15 grains of sodium salicylate for every 100 pounds of live hog.

COMMON DISEASES OF SWINE—Continued

NAME, NATURE AND CAUSES	USUAL SYMPTOMS	PREVENTION AND TREATMENT
Rickets. A disease of young animals, exact cause unknown, characterized by failure of the bones to harden. Lack of mineral salts in the ration, or defective metabolism, may be responsible.	The legs bow, the back drops, the gait is spraddling and hard swellings occur on the head and joints. Affected animals usually are stunted and pot-bellied.	Feed less corn, but more milk, oilmeal, tankage, clover or alfalfa crops. Give 2 to 10 grains precipitated calcium phosphate to each pig in milk or feed. Keep available wood ashes, charcoal, or air-slaked lime.
Scours. In nursing pigs this may be due to the sow being too fat, to sudden change in feed of sows, or to feed too rich in protein. Dirty troughs, damp quarters and filth are also causes.	The bowel discharges are thin, watery, and too frequent. The pigs are gaunt and listless.	Lime water is a splendid corrective, but the disease may be controlled by removing the cause.
Sore-mouth and Bull-nose. Diseases of pigs caused by a germ, found in filthy soil, gaining entrance to the membranes of the mouth and nose.	Swellings on snout or sore patches in mouth or both. Unthrifty condition, fever, and lack of growth.	To prevent keep pigs in clean, dry quarters, in which swine have not been kept before; dip the heads of all the pigs in a pail of warm potassium permanganate, 1 tablespoon to 2 gallons of boiled water. Canker sores should be scraped and tincture of iodine applied. Abscesses should be lanced.
Swine Plague or Hemorrhagic Septicemia. A suddenly appearing disease	Appetite but slightly impaired, fever, bowel evacuations normal or bloody, lab-	Good nursing is more essential than medicines in this disease. Mixed bacterins

often following exposure, shipment, etc., or breathing, thumps, coughing. The have been used, but results obtained do with a low mortality. Animals often re- not justify employing them except as a cover spontaneously but hog cholera serum preventive. is not effective.

Thumps. This is seen only in young pigs and is due to over-feeding and lack of exercise.

A sudden jerking movement of the flanks similar to hiccoughs in man.

A proper ration and daily exercise will prevent thumps. A physic is helpful. Keep affected pigs hungry.

Tuberculosis. A communicable disease caused by a germ which was acquired from tubercular cattle or swine.

Gradual loss of flesh, symptoms of pneumonia, and internal organs studded with tubercles.

Have all cattle tuberculin tested and feed only pasteurized dairy by-products or those from a clean herd. Dispose of all exposed hogs at once. Medicinal treatment is not warranted.

Worms. (See Intestinal Worms).

Same as for Intestinal Worms.

Same as for Intestinal Worms.

GIVING MEDICINE TO SWINE

Usually swine will take medicine in the feed or drink. Occasionally it is desired to administer drugs by means of a drench, in which case great care should be exercised, as many valuable animals are killed by improper drenching.

To drench pigs, first have the attendant elevate the animal's head a little. If a rope or other soft material is put into the mouth, the pig, in an effort to expel the rope, will stop squealing and medicine can be given with a dose syringe or a funnel and rubber hose. The fluid should not be administered when the pig is squealing, as the windpipe is open and the medicine would be taken into the lungs, that is, "go down the wrong way" and strangle the animal.

When questions arise in regard to diseases of livestock that you wish further information about, write to the Department of Veterinary Science, University of Wisconsin.

Circular 129

September 1920

Profitable Cows

EXTENSION SERVICE OF THE COLLEGE OF AGRICULTURE

THE UNIVERSITY OF WISCONSIN

IN CO-OPERATION WITH

THE WISCONSIN DAIRYMEN'S ASSOCIATION

WHY?

The Wisconsin Register of Production was established:

1. To secure better breeding, better feeding methods, and better care for Wisconsin dairy cows.
2. To emphasize the necessity of judging a bull according to the work of his daughters.
3. To increase the purchase and sale of cows on the basis of yearly production, and of calves and bulls.
4. To establish recognized yearly records for purebred and grade cows when these cows would otherwise be without records.

Profitable Cows

A. J. CRAMER AND R. T. HARRIS

Milk in one form or another is a most necessary food. Children must have it to be healthy and strong. Grown people ought to use it because of its value as a food and its relative cheapness. Yet, while the use of milk is increasing, the consumption is still small in comparison with that of the other two great sources of human food, the cereals and meat. Habits of life change slowly, and people especially dislike to change their food habits. But when consumers find how much better and more cheaply they can live by a more liberal consumption of dairy products, new methods will certainly have to be followed by producers of milk to keep pace with the demand.

The cities need milk, good milk, delivered in good condition and at a reasonable price. It must be produced in the country. The dairy farm is the manufacturing plant in which the first step toward supplying this need is made. As a business man, the dairyman cannot afford to sell milk below cost. Like other business men he finds his costs of doing business mounting, and like others he must ask more for his product. Milk will cost the consumer more and more until feed, labor, and material are cheaper.

But this manufacturer, like others, cannot shift all the increased cost to the price of the product. A part must be met through more efficient management. This includes a simple plan of work, labor saving machinery, silos, and cooperation in purchases of supplies and marketing of product. The cow-testing association is providing him with more definite and reliable information, an essential to success in any business. This enables him to replace his worn-out or unprofitable cows with more modern dairy machines—better-bred animals.

The average period of usefulness of a dairy cow is hardly more than six years. Every farm, no matter how small, has re-



FIG. 1.—THREE CHAMPION R. O. P. COWS OF WISCONSIN

Aggie, grade Holstein of Cedar Grove association. Record 16,916 pounds of milk, 667.7 pounds of butterfat.

Sweetheart, grade Guernsey of Chilton association. Record of 11,220 pounds of milk, 637.6 pounds of butterfat.

Trinket Ebony L, registered Jersey of Haven-Cleveland association. Record of 10,523 pounds of milk, 610.4 pounds of butterfat.

placements to make and the unfit to remove—some to the scrap heap, others to usefulness under less exacting conditions. The Register of Production, established in 1918 to promote more and better dairying, works in connection with cow-testing associations. It is intended to show the way to replace the poor cows with better and the better with the best.

In the first place it demonstrates that high standards can be reached by the "common" dairyman if he tries. It shows also something of how good cows come to be—how dairy qualities are inherited and how they are brought out by good feeding and care. Not all good cows are purebreds, nor are all purebreds good cows. It is not practicable nor really desirable that all herds be purebred but no progress can be hoped for through the scrub. Our main dependence for dairy production will, for generations, be the grade cow. To get her we must have the purebred and for both we need a means of measurement and a record, which we have in the scales and Babcock test, the Advanced Register and the Register of Production.

SELECTING DAIRY COWS

Experienced buyers look first for health and vigor along with signs of milking tendencies. A clear and full, but placid, eye; a soft hide; a capacious udder not meaty and with even quarters; and a large body with well-sprung ribs, make a favorable impression. Symmetry and fineness of bone indicate breeding, but this should not be sought at the expense of strength. The durable cow is not always handsome, but she has a certain solidity about her which can be recognized. Now that records are becoming available, buyers inquire about performance of relatives, particularly the dam and daughters of the sire. As a permanent addition to a herd, a relatively inferior cow from a good family is to be preferred to a better individual from a less desirable family.

FEEDING FOR MILK PRODUCTION

Even a casual examination of the feeding records of the cows entered in the Register of Production, indicates that these cows were liberally fed. All had grain and all but a very few were fed silage. Where the kinds of grain are reported, the presence

of some commercial feeding stuff will be remarked or it will be seen that the farm-grown grains have been supplemented or balanced by the addition of oilmeal, cotton-seed meal, or some such high protein feed.

Heavy grain feeding is considered a wasteful practice, but liberal feeding of a suitable variety of grains, rationed according to the production of the animals, pays well under anything like normal conditions. The most common error in feeding is to



FIG. 2.—BREEDING, FEEDING, AND CARE MADE THE LEADING HERD

Each of the 8 cows in this herd won a place in the Register of Production. The herd from which these cows came averaged 13,737 lbs. of milk and 502 lbs. of butterfat. The ages range from 3 to 8 years.

feed all alike regardless of needs or capacity. Where this is done, the good cow gets too little and the poor cow receives too much. Either is a waste. It is perfectly plain that, if a cow capable of producing 40 pounds of milk at a profit is only given enough to enable her to yield 30 pounds, her owner will be the

TABLE I.—THE PERFORMANCE OF TWO GRADE COWS KEPT UNDER SIMILAR CONDITIONS WITH NEARLY THE SAME FEED.

	Age	Milk (lbs.)	Fat (lbs.)	Value of Product	Cost of Feed	Return Over Feed Cost
Curley	8	8,947	273.7	\$251.25	\$137.50	\$113.76
Baldy	7	14,679	594.5	438.52	166.60	271.92

loser. Underfeeding is one of the great sources of loss to the dairyman. Not only does it result in a temporary under-production, but it also means undeveloped capacity to produce. The large barrel and capacious udder of the good dairy cow are only developed by good feeding. With cows high in price, and labor and feed costly, the way to economy is through producing the most possible from the smallest number of cows. It needs close attention on the part of the feeder and continual study of individual animals as well as the qualities and effects of different kinds of feeds and combinations of them.

Forced feeding is not to be recommended. Those who drive cars know that throwing wide the throttle allowing the motor to take more gas than it can burn has three results. It wastes fuel, causes rapid deterioration of the motor, and racks the whole machine. Over-feeding has the same effect on a dairy cow.

Feeding begins with the calf, which ought to be well grown. Before freshening is an important period often neglected. It does not pay to skimp a cow while she is dry and carrying a calf. Neglect then must be paid for later. Cheap milk is not made by allowing cows to endure discomfort unnecessarily, such as exposure to cold storms, cramping stanchions; or rough treatment by dogs or men. The cheapest aids to feeding are plenty of pure water, sunlight, fresh air and comfortable beds. These both raise production and lengthen the period of usefulness in the herd.

Inasmuch as these facts relate to dairy production, they also relate to the Register of Production, one of the agencies intended to promote better and more profitable dairying. Established in 1918, the Register showed the names of 421 cows at the end of the first 12 months. The only qualification for membership is that the cow shall have averaged a pound of butterfat a day for a year. Every one of the 53,000 cows in the 115 cow-testing associations in Wisconsin is eligible, regardless of age or breeding.

Blue Dickinson, a six-year-old grade Holstein owned in Walworth County, was the first cow entered in the Wisconsin Register of Production. Aggie, a six-year old grade Holstein owned in Sheboygan County, is the highest record cow in the Register. In her association year she made 16,916 pounds of milk and

667.7 pounds of butterfat. These are cows that, outside of a cow-testing association, would never have had an official record to show their performance. Of the 116 purebred cows on the Register, not one had any other official record to her credit, which shows that the Register has enabled records of yearly production to be placed on them. Aside from the importance



FIG. 3.—BABCOCK TEST TELLS THE STORY

The cow that produces only 129 lbs. of butterfat in a year may look like the one that produces 582 lbs. but the Babcock test shows which one to sell.

of knowing the output of his dairy machines, the dairyman having such records profits in the sale of the cows and their offspring.

TABLE II.—A SUMMARY OF THE R. O. P. RECORDS.

Breed	No. of Cows	Average Yearly Production		Average Test
		Milk (lbs.)	Fat (lbs.)	
P. B. Holstein.....	86	11,885	421.8	3.55
Gr. Holstein.....	170	11,675	409.0	3.75
P. B. Guernsey.....	22	8,215	421.1	5.12
Gr. Guernsey.....	82	8,835	401.5	4.82
P. B. Jersey.....	6	7,807	406.1	5.21
Gr. Jersey.....	24	8,035	405.4	5.04
P. B. Ayrshire.....	2	10,477	410.4	3.92
Gr. Shorthorn.....	2	8,842	390.9	4.43
Native.....	27	9,793	404.3	4.35
Total averages.....	421	9,464	407.8	4.31

THE RULES OF THE R. O. P.

1. The Wisconsin Cow Testing Association Register of Production shall be considered a part of the cooperative project of the Wisconsin Dairymen's Association and the University of Wisconsin. The supervision and control of the Register shall be vested in the aforementioned cooperating parties and their decision shall be final in all matters pertaining to the work. The work shall be done under the direction of the Secretary of the Wisconsin Dairymen's Association and he shall authenticate all records. Appeals from the decisions or rulings of the Secretary may be made to the cooperating parties above described.

2. Entry in the Register is a privilege and not a right. The secretary at his own discretion may refuse to enter a cow in the Register or issue a Certificate of Registry, provided he is convinced that fraud has been resorted to by the owner, herdsman, or tester.

3. The main features of the Register shall be to issue certificates for all animals that qualify, and to publish a year book giving information concerning each such animal. ..

4. Any cow completing a year's record in any regularly organized cow testing association in Wisconsin and making not less than 365 pounds of butter fat during the association year is eligible to registry, provided the owner of such cow is a member of an association for the following association year. If the association is not reorganized, the owner will not be debarred from entry provided he has been of service in attempting to reorganize the association.

5. Any purebred bull having two daughters from different dams that have been entered in the Wisconsin Register of Production shall be eligible for registry.

6. The fee for entry of each cow shall be \$1.00, such fee to accompany the application for registry.

7. In case a cow makes a more creditable record later, her re-entry in the Register will be secured in the same way as was the original entry.

8. All applications for entry must be filed with the Secretary or such person as he shall designate, and each application shall be signed by the owner, and attested by the tester and the secretary of the association to which the cow belongs.

9. All applications for registry shall be properly recorded and preserved. For each animal admitted to the entry in the Register the owner shall be supplied with a proper Certificate of Production.

10. Records of production shall be based on the association year and not the lactation period of the cow.

11. No record will be accepted for registry unless the tester of the association supplies a complete report of the association in the "Association Ledger" or on other approved forms.

12. No cow will be recorded or certificate issued until all items in the application have been checked by those in charge of the Register with the association records on file.

13. Any incorrect entry may be expunged from the record, the certificate revoked, and such action will be published.

14. A year book will be published giving the essentials of the record, together with the name and address of the owner of the animal accepted for entry.

15. If found necessary daily milk records may be required on all cows admitted to the Register.

16. For cows qualifying two or more years in succession a special class or designation will be given in the year book and on the certificate.

Of the 421 cows qualifying for the R. O. P the first year

421 cows were fed grain in the ration

421 cows averaged 9,464 pounds of milk

416 cows were fed silage in the ration

116 cows were purebred

27 cows produced 500 pounds or more of butterfat

REGISTER OF PRODUCTION

ALBAN AND NEW HOPE ASSOCIATION

Bestul, Martin J., Scandinavia.

R. O. P. 8—Star No. 8: Gr. Holstein; 8 yrs.; fresh Dec. 1, 1916 and Dec. 4, 1917; record from Mar. 1, 1917 to Mar. 1, 1918.

Production: Milk 9,590 lbs., fat 366.5 lbs., test 3.82 per cent.

Feed (lbs.): Pasture 157 (days); silage 8,100; mixed hay 2,840; oats 652; oilmeal 70; unicorn 222; bran 255.

Brekke, Anton B., Rosholt.

R. O. P. 39—2nd Johanna: Gr. Holstein; 4 yrs.; fresh Jan. 4, 1917 and Jan. 4, 1918; record from Mar. 1, 1917 to Mar. 1, 1918.

Production: Milk 10,339 lbs., fat 391.4 lbs., test 3.78 per cent.

Feed (lbs.): Pasture 214 (days); silage 5,670; mixed hay 1,260; brewers' grain 180; corn 187; oats 284; bran 328; unicorn 370; oilmeal 75.

Dahlen, Norman, Northland.

R. O. P. 6—Silver Ollie 2nd: Gr. Guernsey; 7 yrs.; fresh Nov. 1, 1916 and Oct. 28, 1917; record from Mar. 1, 1917 to Mar. 1, 1918.

Production: Milk 6,868 lbs., fat 395.9 lbs., test 5.77 per cent.

Feed (lbs.): Pasture 173 (days); silage 5,400; hay 1,600; oats 564; corn 32; bran 224; oilmeal 32; unicorn 200.

Halvorsen, Otto, Rosholt.

R. O. P. 4—Beauty: Native; 11 yrs.; fresh May 19, 1916 and May 27, 1917; record from Mar. 1, 1917 to Mar. 1, 1918.

Production: Milk 10,470 lbs., fat 436.3 lbs., test 4.17 per cent.

Feed (lbs.): Pasture 203 (days); silage 7,430; hay 2,700; bran 330; oats 540; unicorn 450.

Larson, J. Le Roy, Iola.

R. O. P. 9—Lusy: Gr. Guernsey; 9 yrs.; fresh Dec. 7, 1916 and Oct. 27, 1917; record from Mar. 1, 1917 to Mar. 1, 1918.

Production: Milk 6,611 lbs., fat 384.7 lbs., test 5.82 per cent.

Feed (lbs.): Pasture 157 (days); silage 5,125; mixed hay 1,530; brewers' grain 73; corn 192; oats 927; oilmeal 114; bran 330; potatoes 280.

Woysland, C. O., Amherst Junction.

R. O. P. 5—Golden Belle of Amherst, 41,551: Reg. Guernsey; 7 yrs.; fresh Mar. 6, 1917; record from Mar. 1, 1917 to Mar. 1, 1918.

Production: Milk 6,102 lbs., fat 399.1 lbs., test 6.54 per cent.

Feed (lbs.): Pasture 173 (days); silage 4,695; mixed hay 1,870; bran 293; corn and oats 360; unicorn 203; ground oats 150.

Wrolstad, M. J., Northland.

R. O. P. 2—Mary, No. 21: Gr. Guernsey; 5 yrs.; fresh Feb. 4, 1917 and Jan. 10, 1918; record from Mar. 1, 1917 to Mar. 1, 1918.

Production: Milk 8,376 lbs., fat 419.6 lbs., test 5.01 per cent.

Feed (lbs.): Pasture 203 (days); silage 3,120; hay 2,500; brewers' grain 150; oats and barley 485; bran 425; unicorn 335.

R. O. P. 3—Beauty, No. 6: Gr. Guernsey; 8 yrs.; fresh Nov. 16, 1916 and Nov. 8, 1917; record from Mar. 1, 1917 to Mar. 1, 1918.

Production: Milk 7,041 lbs., fat 404.8 lbs., test 5.75 per cent.

Feed (lbs.): Pasture 203 (days); silage 3,150; hay 2,650; brewers' grain 120; bran 515; barley and oats 530; unicorn 410.

R. O. P. 10—Bessie, No. 9: Gr. Guernsey; 12 yrs.; fresh Jan. 10, 1917 and Jan. 11, 1918; record from Mar. 1, 1917 to March 1, 1918.

Production: Milk 8,092 lbs., fat 411.6 lbs., test 5.09 per cent.

Feed (lbs.): Pasture 203 (days); silage 3,150; hay 2,650; brewers' grain 150; bran 435; oats and barley 495; unicorn 345.

ALMA CENTER ASSOCIATION

Hawley, E. W., Alma Center.

R. O. P. 253—Queen: Gr. Guernsey ———; fresh May 11, 1917; record from July 1, 1917 to July 1, 1918.

Production: Milk 8,139 lbs., fat 365.3 lbs., test 4.49 per cent.

Feed (lbs.): Pasture 158 (days); silage 7,757; hay 940; green oats 1,468; alfalfa hay 425.

R. O. P. 254—Bessie: Gr. Guernsey; 9 yrs.; fresh Jan. 10, 1917 and Nov. 28, 1917; record from July 1, 1917 to July 1, 1918.

Production: Milk 7,985 lbs., fat 376.0 lbs., test 4.72 per cent.

Feed (lbs.): Pasture 158 (days); hay 940; silage 7,757; grain mixture 1,364; alfalfa hay 425.

Held, Peter, Alma Center.

R. O. P. 257—Dolly Dimple: Gr. Guernsey; 9 yrs.; fresh Mar. 20, 1917 and Feb. 10, 1918; record from June 17, 1917 to June 17, 1918.

Production: Milk 8,611 lbs., fat 378.1 lbs., test 4.39 per cent.

Feed (lbs.): Pasture 167 (days); silage 6,034; hay 1,828; grain mixture 1,780.

Hohenstein, Fred, Alma Center.

R. O. P. 252—Johanna: Gr. Holstein; 11 yrs.; fresh Oct. 14, 1917; record from June 15, 1917 to June 15, 1918.

Production: Milk 8,848 lbs., fat 381.9 lbs., test 4.32 per cent.

Feed (lbs.): Pasture 152 (days); silage 7,050; hay 1,890; grain mixture 2,632.

R. O. P. 251—Black Boss: Gr. Holstein; 14 yrs.; fresh Sept. 20, 1917; record from June 27, 1917 to June 27, 1918.

Production: Milk 11,262 lbs., fat 389.3 lbs., test 3.46 per cent.

Feed (lbs.): Pasture 122 (days); silage 7,050; hay 1,874; grain mixture 2,468.

Joos, F. B., Alma Center.

R. O. P. 255—Dusky: Gr. Jersey; 8 yrs.; fresh June 7, 1917; record from July 1, 1917 to July 1, 1918.

Production: Milk 7,718 lbs., fat 391.7 lbs., test 5.08 per cent.

Feed (lbs.): Pasture 132 (days); silage 10,729; hay 1,978; ground oats 396; timothy 497; grain mixture 1,156.

R. O. P. 256—Meg: Gr. Jersey; 9 yrs.; fresh Dec. 10, 1916 and Dec. 20, 1917; record from July 1, 1917 to July 1, 1918.

Production: Milk 9,215 lbs., fat 410.4 lbs., test 4.45 per cent.

Feed (lbs.): Pasture 132 (days); silage 10,727; hay 1,978; ground oats 176; timothy 497; grain mixture 1,666.

Moore, F. R., Humbird.

R. O. P. 250—Johanna Jessie Pearl, 132,518: Reg. Holstein; 10 yrs.; fresh Oct. 5, 1916 and Nov. 25, 1917; record from July 19, 1917 to July 19, 1918.

Production: Milk 11,454 lbs., fat 428.1 lbs., test 3.74 per cent.

Feed (lbs.): Pasture 184 (days); silage 9,446; hay 1,258; grain mixture 3,144.

ANSTON BROWN CO. ASSOCIATION

Herber, Peter, Green Bay.

R. O. P. 284—Miss Simmons, 169,461: Reg. Holstein; 8 yrs.; fresh Oct. 1, 1917 and Sept. 1, 1918; record from January, 1918 to January, 1919.

Production: Milk 10,828 lbs., fat 386.8 lbs., test 3.57 per cent.

Feed (lbs.): Pasture 135 (days); silage 6,750; hay 2,340; grain ration 2,710.

R. O. P. 285—Mirandy: Gr. Holstein; 8 yrs.; fresh April 30, 1918; record from January, 1918 to January, 1919.

Production: Milk 9,749 lbs., fat 423.2 lbs., test 4.34 per cent.

Feed (lbs.): Pasture 167 (days); silage 6,750; hay 2,340; grain ration 1,705.

R. O. P. 286—Lottie Douglas De Kol, 270,800: Reg. Holstein; 5 yrs.; fresh Oct. 7, 1917 and Sept. 30, 1918; record from January, 1918 to January, 1919.

Production: Milk 9,838 lbs., fat 366.5 lbs., test 3.73 per cent.

Feed (lbs.): Pasture 165 (days); silage 6,750; hay 2,440; grain mixture 2,260.

R. O. P. 287—Hilda Jewel De Kol, 233,499: Reg. Holstein; 6 yrs.; fresh Nov. 22, 1917 and Nov. 15, 1918; record from January, 1918 to January, 1919.

Production: Milk 10,268 lbs., fat 383.8 lbs., test 3.74 per cent.

Feed (lbs.): Pasture 166 (days); silage 6,750; hay 2,340; grain mixture 2,450.

R. O. P. 288—Daisy Jewel Pauline, 233,501: Reg. Holstein; 6 yrs.; fresh Aug. 22, 1917 and Sept. 2, 1918; record from January, 1918 to January, 1919.

Production: Milk 10,764 lbs., fat 375.7 lbs., test 3.49 per cent.

Feed (lbs.): Pasture 166 (days); silage 6,750; hay 2,340; grain mixture 2,510.

R. O. P. 289—Eva: Gr. Holstein; 10 yrs.; fresh Dec. 21, 1917 and Nov. 20, 1918; record from January, 1918 to January, 1919.

Production: Milk 9,786 lbs., fat 426.9 lbs., test 4.36 per cent.

Feed (lbs.): Pasture 197 (days); silage 6,750; hay 2,340; grain mixture 2,205.

R. O. P. 290—Pioneer Lottie De Kol, 127,151: Reg. Holstein; 10 yrs.; fresh Sept. 14, 1917 and Sept. 18, 1918; record from January, 1918 to January, 1919.

Production: Milk 11,892 lbs., fat 472.1 lbs., test 3.97 per cent.

Feed (lbs.): Pasture 197 (days); silage 6,750; hay 2,340; grain ration 2,687;

Lucia, Geo. O., Route 8, Green Bay.

R. O. P. 281—Glenwood's Rosetta, 43,005: Reg. Guernsey; 7 yrs.; fresh Nov. 10, 1917; record from Feb. 14, 1918 to Feb. 14, 1919.

Production: Milk 8,256 lbs., fat 366.9 lbs., test 4.44 per cent.

Feed (lbs.): Pasture 183 (days); silage 6,210; hay 1,050; grain mixture 1,050; roots 480.

Moos, James, Route 1, Oneida.

R. O. P. 291—Nigger: Gr. Holstein; 7 yrs.; fresh Dec. 15, 1917 and Jan. 23, 1918; record from Jan. 29, 1918 to Jan. 29, 1919.

Production: Milk 9,534 lbs., fat 405.7 lbs., test 4.26 per cent.

Feed (lbs.): Pasture 172 (days); hay 3,090; grain ration 1,971.

Pamperin, A. R., Green Bay.

R. O. P. 282—Appleton: Gr. Guernsey; 7 yrs.; fresh April 1, 1918; record from Feb. 18, 1918 to Feb. 18, 1919.

Production: Milk 11,556 lbs., fat 569 lbs., test 4.93 per cent.

Feed (lbs.): Pasture 197 (days); silage 6,060; clover hay 1,800; grain ration 3,570.

R. O. P. 283—Jennie 2nd: Gr. Guernsey; 6 yrs.; fresh Jan. 10, 1918; record from Feb. 14, 1918 to Feb. 14, 1919.

Production: Milk 8,769 lbs., fat 409.4 lbs., test 4.67 per cent.

Feed (lbs.): Pasture 197 (days); silage 6,000; clover hay 1,800; ground feed 1,413.

BARABOO ASSOCIATION

McGilvra, Ed, Baraboo.

R. O. P. 7—Dora of Hill Crest, 296,756: Reg. Jersey; 8 yrs.; fresh Mar. 10, 1916 and Mar. 30, 1917; record from July 1, 1916 to July 1, 1917.

Production: Milk 7,586 lbs., fat 414.8 lbs., test 5.47 per cent.

Feed (lbs.): Pasture 183 (days); grain 1,981; silage 5,865; alfalfa 1,110.

R. O. P. 85—Clarissa J., 217,170: Reg. Jersey; 11 yrs.; fresh; record from July 1, 1916 to July 1, 1917.

Production: Milk 8,104 lbs., fat 428.3 lbs., test 5.3 per cent.

Feed (lbs.): Pasture 183 (days); grain 1,981; silage 5,865; alfalfa 720.

R. O. P. 86—Mc's Pride of Hill Crest, 293,620: Reg. Jersey; 10 yrs.; fresh May 31, 1916 and Aug. 13, 1917; record from July 1, 1916 to July 1, 1917.

Production: Milk 7,991 lbs., fat 401.7 lbs., test 5.03 per cent.

Feed (lbs.): Pasture 213 (days); grain 2,033; silage 5,865; alfalfa 945.

BARNEVELD ASSOCIATION

Ruste, Olin, Barneveld.

R. O. P. 280—Gerda Beryl Wayne De Kol, 148,351: Reg. Holstein; 9 yrs.; fresh Mar. 2, 1918 and Feb. 21, 1919; record from Feb. 29, 1918 to Feb. 29, 1919.

Production: Milk 11,711 lbs., fat 393.8 lbs., test 3.36 per cent.

Feed (lbs.): Pasture 174 (days); silage 6,040; hay 1,830; straw 518; beets 284; grain 2,385.

BYRON ASSOCIATION

Cowles, E. M., South Byron.

R. O. P. 201—Uneeda Korndyke Freda, 253,129: Reg. Holstein; 5 yrs.; fresh Feb. 8, 1917 and Nov. 19, 1917; record from August, 1917 to August, 1918.

Production: Milk 10,711 lbs., fat 429.3 lbs., test 4.04 per cent.

Feed (lbs.): Pasture 183 (days); hay 4,119; corn silage 7,040; concentrates 3,512.

R. O. P. 202—Jenny: Gr. Holstein; 9 yrs.; fresh Nov. 17, 1916 and Nov. 27, 1917; record from August, 1917 to August, 1918.

Production: Milk 11,512 lbs., fat 390.7 lbs., test 3.39 per cent.

Feed (lbs.): Pasture 183 (days); hay 1,220; corn silage 7,040; concentrates 3,512.

R. O. P. 203—Oakfield Lucyia Johanna, 256,078: Reg. Holstein; fresh Jan. 8, 1918; record from August, 1917 to August, 1918.

Production: Milk 12,935 lbs., fat 528.5 lbs., test 4.08 per cent.

Feed (lbs.): Pasture 183 (days); hay 1,220; corn silage 7,040; concentrates 2,642.

R. O. P. 204—Daisy: Gr. Holstein; 11 yrs.; fresh Oct. 20, 1916 and Nov. 10, 1917; record from August, 1917 to August, 1918.

Production: Milk 12,633 lbs., fat 418.7 lbs., test 3.31 per cent.

Feed (lbs.): Pasture 183 (days); hay 1,220; corn silage 7,040; concentrates 3,252.

McClain, Robert C., Route 28, Oakfield.

R. O. P. 205—Midnight of Maple Lawn: Native; 9 yrs.; fresh Dec. 13, 1916 and Nov. 27, 1917; record from August, 1917 to August, 1918.

Production: Milk 11,070 lbs., fat 463.7 lbs., test 4.18 per cent.

Feed (lbs.): Pasture 214 (days); mixed hay 1,664; corn silage 6,130; concentrates 1,366.

Tulledge, A. E., Route 28, Oakfield.

R. O. P. 207—Cassie Douglass De Kol 2nd, 209,279: Reg. Holstein; 10 yrs.; fresh Jan. 29, 1918; record from August, 1917 to August, 1918.

Production: Milk 12,036 lbs., fat 369.8 lbs., test 3.07 per cent.

Feed (lbs.): Pasture 153 (days); corn silage 7,435; hay 2,440; concentrates 1,144.

R. O. P. 209—Winnetonika Colantha, 179,098: Reg. Holstein; 8 yrs.; fresh Dec. 17, 1916 and Dec. 31, 1917; record from August, 1917 to August, 1918.

Production: Milk 9,935 lbs., fat 369.6 lbs., test 3.72 per cent.

Feed (lbs.): Pasture 153 (days); corn silage 7,435; hay 2,440; concentrates 1,105.

Tulledge, George, Oakfield.

R. O. P. 200—Beauty: Gr. Holstein;—fresh Dec. 17, 1916 and Nov. 29, 1917; record from August 1, 1917 to August 1, 1918.

Production: Milk 9,919 lbs., fat 384.7 lbs., test 3.88 per cent.

Feed (lbs.): Pasture 214 (days); hay 2,196; corn silage 3,700; concentrates 1,060.

R. O. P. 206—Bessie: Gr. Holstein; 10 yrs.; fresh June 17, 1917 and July 20, 1918; record from August, 1917 to August, 1918.

Production: Milk 9,702 lbs., fat 367.9 lbs., test 3.79 per cent.

Feed (lbs.): Pasture 214 (days); hay 2,196; corn silage 3,700; concentrates 680.

R. O. P. 208—Pride: Gr. Holstein; 6 yrs.; fresh Jan. 20, 1917 and Feb. 26, 1918; record from August, 1917 to August, 1918.

Production: Milk 11,911 lbs., fat 396.9 lbs., test 3.33 per cent.

Feed (lbs.): Pasture 214 (days); hay 2,196; corn silage 3,700; concentrates 880.

CEDAR GROVE ASSOCIATION

Baden, Robert J., Cedar Grove.

R. O. P. 301—Grace: Gr. Holstein; 9 yrs.; fresh June, 1917 and June 6, 1918; record from July, 1918 to July, 1919.

Production: Milk 9,834 lbs., fat 403.6 lbs., test 4.10 per cent.

Feed (lbs.): Pasture 152 (days); green corn 2,579; pea silage 900; bran 785; gluten 975; ground oats 759; oilmeal 158; ground barley 50; cottonseed meal 33; corn silage 5,452; alfalfa hay 1,114.

R. O. P. 302—Rose: Gr. Holstein; 14 yrs.; fresh Dec. 1, 1917 and Nov. 1, 1918; record from July, 1918 to July, 1919.

Production: Milk 10,295 lbs., fat 393.0 lbs., test 3.82 per cent.

Feed (lbs.): Pasture 152 (days); green corn 1,469; pea vines 900; bran 753; gluten 987; ground oats 878; oilmeal 138; green oats 150; ground barley 68; cottonseed meal 33; alfalfa 1,114; silage 5,452.

R. O. P. 317—Caroline: Gr. Holstein; 9 yrs.; fresh June, 1917 and June 13, 1919; record from July, 1918 to July, 1919.

Production: Milk 12,476 lbs., fat 436.3 lbs., test 3.50 per cent.

Feed (lbs.): Pasture 152 (days); green corn 2,279; pea vines 900; bran 975; gluten 1,204; ground oats 871; oilmeal 190; green oats 150; alfalfa 1,114; cottonseed meal 50; silage 5,622; ground barley 68.

R. O. P. 320—Piebe: Gr. Holstein; 7 yrs.; fresh Feb. 12, 1918 and Dec. 18, 1918; record from July, 1918 to July, 1919.

Production: Milk 14,097 lbs., fat 504.6 lbs., test 3.58 per cent.

Feed (lbs.): Pasture 152 (days); green corn 1,469; pea vines 900; bran 590; gluten 1,056; ground oats 954; oilmeal 217; green oats 150; silage 5,478; cottonseed meal 33; alfalfa 1,290; ground barley 87.

R. O. P. 323—Garl: Gr. Holstein; 7 yrs.; fresh April 21, 1918 and Mar. 21, 1919; record from July, 1918 to July, 1919.

Production: Milk 11,041 lbs., fat 425.5 lbs., test 3.85 per cent.

Feed (lbs.): Pasture 152 (days); green corn 1,469; pea vines 900; bran 773; gluten 1,096; ground oats 778; oilmeal 146; green oats 150; ground barley 7; cottonseed meal 33; alfalfa 936; silage 4,987.

R. O. P. 361—Josephine: Gr. Holstein; 5 yrs.; fresh Mar., 1918 and Jan. 26, 1919; record from July, 1918 to July, 1919.

Production: Milk 11,499 lbs., fat 402.4 lbs., test 3.50 per cent.

Feed (lbs.): Pasture 152 (days); green corn 1,469; pea silage 900; bran 721; gluten 966; ground oats 836; oilmeal 195; green oats 150; ground barley 87; corn silage 5,602; cottonseed meal 33; alfalfa 1,122.

Bloemers, James T., Oostburg.

R. O. P. 239—Flora: Gr. Holstein; 9 yrs.; fresh Jan., 1917 and Jan. 25, 1918; record from May 26, 1917 to May 26, 1918.

Production: Milk 11,399 lbs., fat 395.7 lbs., test 3.56 per cent.

Feed (lbs.): Pasture 153 (days); grain mixture 307; silage 6,778; hay 2,210; gluten 256; bran 290; ground oats 427; vitex feed 906; oilmeal 210; straw 189.

R. O. P. 335—Flora: Gr. Holstein; 9 yrs.; fresh Jan. 14, 1918 and Jan. 7, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 11,873 lbs., fat 452.9 lbs., test 3.81 per cent.

Feed (lbs.): Pasture 122 (days); silage 6,977; ground corn 2,493; bran 857; alfalfa meal 2,769; hominy 140; sucrene 344; ground oats 1,078; straw 93; hay 808; oilmeal 314; gluten 414.

R. O. P. 336—Kate: Gr. Holstein; 8 yrs.; fresh Jan. 15, 1917 and Aug. 1, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 13,617 lbs., fat 464.5 lbs., test 3.41 per cent.

Feed (lbs.): Pasture 122 (days); silage 6,977; ground corn 2,769; hominy 140; sucrene 344; ground oats 1,116; bran 933; oilmeal 365; straw 93; gluten 465; hay 808.

R. O. P. 337—Nancy: Gr. Holstein; 5 yrs.; fresh Feb. 24, 1918 and Mar. 6, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 11,107 lbs., fat 416.4 lbs., test 3.75 per cent.

Feed (lbs.): Pasture 122 (days); silage 6,977; ground corn 276; hominy 140; sucrene 349; ground oats 1,269; bran 738; oilmeal 235; straw 93; gluten 335; hay 808.

R. O. P. 338—Belle: Gr. Holstein; 8 yrs.; fresh Jan. 29, 1918 and Feb. 4, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 10,189 lbs., fat 370.2 lbs., test 3.63 per cent.

Feed (lbs.): Pasture 122 (days); silage 6,977; ground corn 276; hominy 140; sucrene 349; ground oats 1,175; bran 824; oilmeal 286; straw 93; gluten 286; hay 808.

R. O. P. 341—Beauty: Gr. Holstein; 7 yrs.; fresh Dec. 18, 1917 and Jan. 3, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 11,024 lbs., fat 407.4 lbs., test 3.70 per cent.

Feed (lbs.): Pasture 122 (days); silage 6,977; ground corn 276; hominy 140; sucrene 349; ground oats 1,116; bran 933; gluten 465; straw 93; oilmeal 365; hay 808.

Brill, B. W., Sheboygan.

R. O. P. 322—Hannah De Colantha Burg, 221,772: Reg. Holstein; 7 yrs.; fresh Jan. 9, 1918 and Dec. 31, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 9,922 lbs., fat 412.4 lbs., test 4.16 per cent.

Feed (lbs.): Pasture 122 (days); silage 7,462; barley 508; gluten 1,144; ground oats 683; bran 3,732; ground corn 279; straw 1,595; sucrene 142; oilmeal 128; cottonseed meal 43.

Brill, John P. Jr., Sheboygan.

R. O. P. 199—May of Wilson, 119,354: Reg. Holstein. 9 yrs.; fresh Jan. 6, 1917 and Jan. 14, 1918; record from May 25, 1917 to May 25, 1918.

Production: Milk 10,642 lbs., fat 400.4 lbs., test 3.75 per cent.

Feed (lbs.): Pasture 165 (days); grain mixture 386; silage 4,690; hay 1,121; gluten 1,143; ground oats 572; corn stover 1,098; oilmeal 85; straw 310; bran 234.

R. O. P. 212—Star of Wilson, 214,175: Reg. Holstein; 5 yrs.; fresh Mar. 31, 1917 and Feb. 19, 1918; record from May 25, 1917 to May 25, 1918.

Production: Milk 13,676 lbs., fat 444.0 lbs., test 3.62 per cent.

Feed (lbs.): Pasture 165 (days); grain mixture 385; silage 3,982; hay 787; gluten 1,575; ground oats 677; corn stover 1,098; oilmeal 106; bran 187.

R. O. P. 213—Tillie of Wilson, 169,710: Reg. Holstein; 7 yrs.; fresh Jan. 20, 1917 and Jan. 13, 1918; record from May 25, 1917 to May 25, 1918.

Production: Milk 12,306 lbs., fat 439.9 lbs., test 3.58 per cent.

Feed (lbs.): Pasture 165 (days); grain mixture 385; silage 4,690; hay 1,121; gluten 1,365; ground oats 659; corn stover 1,098; oilmeal 113; straw 310; bran 273.

R. O. P. 214—Saddie of Wilson, 131,835: Reg. Holstein; 10 yrs.; fresh Dec. 9, 1916 and Dec. 29, 1917; record from May 25, 1917 to May 25, 1918.

Production: Milk 11,289 lbs., fat 384.6 lbs., test 3.41 per cent.

Feed (lbs.): Pasture 165 (days); grain mixture 385; silage 4,690; hay 1,121; gluten 1,144; ground oats 615; corn stover 1,048; oilmeal 112; straw 310; bran 278.

R. O. P. 306—May of Wilson, 119,354: Reg. Holstein; 10 yrs.; fresh Jan. 14, 1918 and Feb. 10, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 10,530 lbs., fat 404.1 lbs., test 3.84 per cent.

Feed (lbs.): Pasture 122 (days); silage 7,646; ground corn 2,400; gluten 1,405; sucrene 114; ground oats 1,017; oilmeal 126; bran 559; straw 310; mixed hay 240; alfalfa 356.

R. O. P. 319—Star of Wilson, 214,175: Reg. Holstein; 6 yrs.; fresh Feb. 19, 1918 and Feb. 5, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 14,533 lbs., fat 524.2 lbs., test 3.61 per cent.

Feed (lbs.): Pasture 122 (days); silage 7,646; ground corn 2,400; gluten 1,666; sucrene 159; ground oats 1,187; oilmeal 145; bran 659; straw 310; mixed hay 240; alfalfa 356.

De Master, Ed., Oostburg.

R. O. P. 241—Mabelle: Native; 6 yrs.; fresh March, 1916 and March 10, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 10,699 lbs., fat 396.6 lbs., test 3.71 per cent.

Feed (lbs.): Pasture 157 (days); silage 8,740; hay 1,360; gluten 768; ground oats 768; oilmeal 134; straw 280; cornmeal 108; Wisconsin balanced ration 143; bran 951.

R. O. P. 315—No. 9: Native; 9 yrs.; fresh Nov. 29, 1917 and Dec. 6, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 10,044 lbs., fat 411.8 lbs., test 4.10 per cent.

Feed (lbs.): Pasture 122 (days); silage 5,186; green corn 2,430; bran 829; balanced ration 139; gluten 891; sucrene 54; oilmeal 185; oat middlings 27; ground corn 124; hay 1,824; straw 372.

R. O. P. 316—No. 5: Native; 6 yrs.; fresh Mar. 15, 1918 and Mar. 19, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 8,821 lbs., fat 385.3 lbs., test 4.37 per cent.

Feed (lbs.): Pasture 122 (days); silage 3,853; green corn 2,430; balanced ration 98; bran 548; gluten 630; sucrene 54; oilmeal 89; ground oats 702; oat middlings 27; ground corn 24; straw 806; hay 1,360.

De Master, John, Cedar Grove.

R. O. P. 321—Pride's Dairy Maid, 42,556: Reg. Ayrshire; 8 yrs.; fresh Sept. 20, 1917 and Oct. 6, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 10,269 lbs., fat 396.8 lbs., test 3.86 per cent.

Feed (lbs.): Pasture 122 (days); ground corn 2,140; hay 1,716; grain ration 184; gluten 479; bran 261; ground oats 399; cornmeal 28; barley 328; oilmeal 39; silage 3,780.

R. O. P. 325—Dairy Maid's Best, 32,600: Reg. Ayrshire; 8 yrs.; fresh Feb. 2, 1918 and Jan. 22, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 10,635 lbs., fat 423.9 lbs., test 3.97 per cent.

Feed (lbs.): Pasture 122 (days); alfalfa hay 3,000; ground corn 623; gluten 578; middlings 53; bran 239; grain ration 306; ground oats 361; cornmeal 21; barley 308; silage 3,920.

De Pagter, Arnold, Oostburg.

R. O. P. 324—Lucy: Native; 8 yrs.; fresh Jan. 18, 1918 and Dec. 20, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 9,619 lbs., fat 367.0 lbs., test 3.82 per cent.

Feed (lbs.): Pasture 122 (days); ground corn 1,744; hay 180; alfalfa hay 428; gluten 872; ground oats 743; bran 395; oilmeal 94; straw 310; silage 4,804; beans 270; barley 544.

R. O. P. 326—Lottie: Native; 6 yrs.; fresh July 12, 1917 and Jan. 6, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 9,032 lbs., fat 374.1 lbs., test 4.14 per cent.

Feed (lbs.): Pasture 158 (days); ground corn 1,744; hay 180; alfalfa hay 1,048; gluten 761; ground oats 511; bran 395; oilmeal 94; straw 310; silage 4,804; beans 270; barley 428.

Eernisse, Peter J., Route 1, Random Lake.

R. O. P. 240—Beauty: Gr. Holstein. 10 yrs.; fresh Dec. 28, 1917; record from May, 1917 to May, 1918.

Production: Milk 11,304 lbs., fat 369.3 lbs., test 3.27 per cent.

Feed (lbs.): Pasture 158 (days); grain mixture 340; silage 6,560; hay 2,835; corn stover 40; ground oats 727; gluten 727; bran 435; oilmeal 121.

R. O. P. 308—Beauty: Gr. Holstein; 13 yrs.; fresh—; record from July 1, 1918 to July 1, 1919.

Production: Milk 12,768 lbs., fat 427.4 lbs., test 3.35 per cent.

Feed (lbs.): Pasture 122 (days); pea vines 150; gluten 1,007; ground oats 1,208; ground corn 2,540; silage 5,285; straw 360; bran 748; oilmeal 180; hay 460; climax 194.

R. O. P. 340—Aaggie: Gr. Holstein; 8 yrs.; fresh Dec. 17, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 10,682 lbs., fat 432.7 lbs., test 4.05 per cent.

Feed (lbs.): Pasture 122 (days); oilmeal 126; gluten 1,101; ground oats 552; bran 357; silage 6,938; hay 305; climax 233; barley 524; cottonseed meal 40; straw 1,235.

Harmeling, E. B. and Sons, Oostburg.

R. O. P. 307—Tura: Gr. Guernsey; 4 yrs.; fresh Jan. 8, 1918 and Feb. 8, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 7,822 lbs., fat 376.0 lbs., test 4.81 per cent.

Feed (lbs.): Pasture 153 (days); silage 3,380; ground corn 1,735; ground oats 640; oilmeal 140; vitex 112; gluten 214; bran 150; chaff 105; hay 366.

R. O. P. 329—Robina: Gr. Guernsey; 4 yrs.; fresh Feb. 10, 1918 and Jan. 20, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 8,912 lbs., fat 426.0 lbs., test 4.78 per cent.

Feed (lbs.): Pasture 153 (days); silage 3,380; ground corn 1,735; ground oats 710; oilmeal 132; vitex 112; alfalfa 105; gluten 238; bran 150; chaff 310; hay 366.

R. O. P. 347—Alberta: Gr. Guernsey; 4 yrs.; fresh Jan. 1, 1918 and Oct. 1, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 9,599 lbs., fat 466.9 lbs., test 4.86 per cent.

Feed (lbs.): Pasture 153 (days); silage 3,752; ground corn 1,735; ground oats 885; oilmeal 187; vitex 112; gluten 333; bran 225; chaff 310; alfalfa 105; bean meal 31; roughage mixture 140; balanced ration 224.

R. O. P. 351—Bessie: Gr. Guernsey. 7 yrs.; fresh Jan. 4, 1918 and Jan. 15, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 8,368 lbs., fat 374 lbs., test 4.47 per cent.

Feed (lbs.): Pasture 153 (days); silage 3,380; ground corn 1,735; ground oats 664; oilmeal 140; vitex 112; gluten 238; bran 150; chaff 415; roughage 140; hay 366.

Hilbelink, Henry, Cedar Grove.

R. O. P. 331—No. 3: P. B. Holstein (not registered); 10 yrs.; fresh Jan. 8, 1918 and Dec. 24, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 10,190 lbs., fat 352.0 lbs., test 3.75 per cent.

Feed (lbs.): Pasture 122 (days); silage 8,525; ground corn 1,375; gluten 977; bran 468; grain ration 795; hay 601; ground oats 442; alfalfa 306.

Hilbelink, John, Oostburg.

R. O. P. 298—No. 1: Gr. Holstein;—fresh Dec. 7, 1916 and Dec. 18, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 9,900 lbs., fat 369.4 lbs., test 3.73 per cent.

Feed (lbs.): Pasture 153 (days); grain mixture 399; silage 7,636; hay 1,820; bran 764; oilmeal 68; ground oats 483; gluten 447; straw 983; vitex 202; Wisconsin balanced ration 356.

R. O. P. 299—No. 15: Gr. Holstein; 11 yrs.; fresh April 7, 1917 and Mar. 4, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 10,888 lbs., fat 375.5 lbs., test 3.45 per cent.

Feed (lbs.): Pasture 153 (days); grain mixture 460; silage 7,955; hay 1,465; bran 588; oilmeal 103; gluten 681; ground oats 723; straw 1,085; vitex 221; sugarine 221.

Huenink, G. J., Cedar Grove

R. O. P. 235—Bessie Yeslet Holland, 191,703: Reg. Holstein; 6 yrs.; fresh Oct. 16, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 12,002 lbs., fat 374.2 lbs., test 3.12 per cent.

Feed (lbs.): Pasture 128 (days); hay 1,685; grain 310; silage 6,340; bran 839; gluten 1,232; oilmeal 111; international dairy feed 760; straw 310; oats 736; corn stalks 1,350.

R. O. P. 243—Bell: Gr. Holstein; 8 yrs.; fresh Sept. 25, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 10,144 lbs., fat 367.0 lbs., test 3.62 per cent.

Feed (lbs.): Pasture 168 (days); hay 821; grain 124; silage 6,653; bran 463; gluten 895; oilmeal 154; international dairy feed 923; straw 620; beans 124; oats 174.

R. O. P. 244—Blossom: Gr. Holstein; 8 yrs.; fresh Oct. 10, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 10,426 lbs., fat 398.2 lbs., test 3.82 per cent.

Feed (lbs.): Pasture 199 (days); hay 821; grain 170; silage 6,655; bran 417; gluten 827; oilmeal 154; international dairy feed 923; straw 620; beans 124; oats 174.

R. O. P. 303—Bessie Yeslet Holland, 191,703: Reg. Holstein; 7 yrs.; fresh;—record from July 1, 1918 to July 1, 1919.

Production: Milk 13,647 lbs., fat 457.4 lbs., test 3.35 per cent.

Feed (lbs.): Pasture 122 (days); green corn 3,287; pea vines 1,140; gluten 1,210; bran 917; ground oats 2,131; oilmeal 152; silage 6,530; sucrene 149; straw 305; climax 155.

R. O. P. 318—Blossom: Gr. Holstein; 9 yrs.; fresh Oct. 8, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 12,634 lbs., fat 520.8 lbs., test 4.12 per cent.

Feed (lbs.): Pasture 122 (days); green corn 3,287; pea vines 1,140; gluten 1,128; bran 879; ground oats 1,057; oilmeal 152; silage 6,530; sucrene 121; straw 305; climax 139.

R. O. P. 327—Mollie: Native; 9 yrs.;—record from July 1, 1918 to July 1, 1919.

Production: Milk 10,839 lbs., fat 409.3 lbs., test 3.78 per cent.

Feed (lbs.): Pasture 122 (days); green corn 3,287; pea vines 1,140; gluten 1,018; bran 636; ground oats 776; silage 6,530; sucrene 121; straw 305; climax 139.

R. O. P. 348—Princess: Gr. Holstein; 5 yrs.; fresh Dec. 7, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 12,113 lbs., fat 377.8 lbs., test 3.12 per cent.

Feed (lbs.): Pasture 122 (days); green corn 3,287; pea vines 1,140; gluten 1,150; bran 742; ground oats 926; sucrene 749; silage 6,530; straw 305; climax 155.

R. O. P. 349—Queen: Gr. Holstein; 6 yrs., fresh Nov. 9, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 11,918 lbs., fat 406.4 lbs., test 3.41 per cent.

Feed (lbs.): Pasture 122 (days); green corn 3,287; pea vines 1,140; gluten 1,068; bran 797; ground oats 937; oilmeal 62; silage 6,530; sucrene 121; straw 305; climax 139.

R. O. P. 350—Belle: Gr. Holstein; 8 yrs.; fresh Nov. 26, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 10,702 lbs., fat 390.9 lbs., test 3.65 per cent.

Feed (lbs.): Pasture 122 (days); green corn 3,287; pea vines 1,140; gluten 1,138; bran 716; ground oats 847; silage 6,530; sucrene 121; straw 305; climax 139.

Huenink and Lubach, Cedar Grove.

R. O. P. 221—Dot: Gr. Holstein; 7 yrs.; fresh Feb. 24, 1917 and April 14, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 10,075 lbs., fat 388.6 lbs., test 3.86 per cent.

Feed (lbs.): Pasture 159 (days); cornmeal 603; silage 7,495; hay 1,935; bran 851; ground oats 1,065; gluten 809; oilmeal 228; soiling crops 620; corn stover 1,685; barley 105.

R. O. P. 222—Molly: Gr. Holstein; 9 yrs.; fresh April 2, 1916 and April 14, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 12,896 lbs., fat 437.8 lbs., test 3.40 per cent.

Feed (lbs.): Pasture 159 (days); cornmeal 575; silage 7,495; hay 1,935; bran 991; ground oats 1,235; gluten 925; oilmeal 251; soiling crops 638; corn stover 1,685; barley 115.

R. O. P. 223—Pietertje Maid Aggie Johanna, 95,532: Reg. Holstein; 10 yrs.; fresh Dec. 15, 1916 and Dec. 16, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 15,124 lbs., fat 518.3 lbs., test 3.43 per cent.

Feed (lbs.): Pasture 159 (days); cornmeal 103; silage 7,495; hay 1,935; bran 1,044; ground oats 1,415; oilmeal 428; soiling crops 620; vitex 444; corn stover 1,685; barley 62; gluten 873.

R. O. P. 224—Lily: Gr. Holstein; 5 yrs.; fresh June 18, 1917 and May 20, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 11,517 lbs., fat 408.3 lbs., test 3.55 per cent.

Feed (lbs.): Pasture 153 (days) cornmeal 325; silage 7,495; hay 1,935; bran 995; ground oats 1,144; gluten 855; oilmeal 256; soiling crops 620; corn stover 1,685; barley 85.

R. O. P. 225—Queen: Gr. Holstein; 7 yrs.; fresh Nov. 27, 1917 and Jan. 1, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 11,720 lbs., fat 407.5 lbs., test 3.48 per cent.

Feed (lbs.): Pasture 159 (days); cornmeal 74; silage 7,495; hay 1,835; bran 911; ground oats 1,282; gluten 782; oilmeal 314; soiling crops 620; corn stover 1,685; barley 361.

R. O. P. 226—Bess: Gr. Holstein; 9 yrs.; fresh Nov. 24, 1915 and Dec. 1, 1916; record from May 1, 1917 to May 1, 1918.

Production: Milk 11,035 lbs., fat 444.9 lbs., test 4.03 per cent.

Feed (lbs.): Pasture 159 (days); silage 7,495; hay 1,935; bran 961; ground oats 1,158; gluten 957; oilmeal 251; soiling crops 620; corn stover 1,685; barley 115.

R. O. P. 227—Spot: Gr. Holstein; 2 yrs.; fresh April 22, 1917 and March 21, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 9,851 lbs., fat 393 lbs., test 3.99 per cent.

Feed (lbs.): Pasture 159 (days); cornmeal 452; silage 7,495; hay 1,935; bran 789; ground oats 1,017; gluten 745; oilmeal 245; soiling crops 620; corn stover 1,685; vitex 110.

R. O. P. 228—Princess: Gr. Holstein; 4 yrs.; fresh Aug. 17, 1916 and Sept. 16, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 12,441 lbs., fat 439.9 lbs., test 3.54 per cent.

Feed (lbs.): Pasture 159 (days); cornmeal 527; silage 7,495; hay 1,935; bran 1,061; ground oats 1,264; gluten 1,000; oilmeal 297; soiling crops 124; corn stover 1,685; barley 62.

R. O. P. 229—Pauline: Gr. Holstein; 4 yrs.; fresh Sept. 19, 1916 and Sept. 26, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 14,036 lbs., fat 460.7 lbs., test 3.28 per cent.

Feed (lbs.): Pasture 161 (days); cornmeal 615; silage 7,495; hay 1,935; bran 987; ground oats 1,334; gluten 1,068; oilmeal 280; soiling crops 1,685; vitex 220; barley 62.

R. O. P. 230—Aggie: Gr. Holstein; 4 yrs.; fresh Mar. 28, 1916 and Mar. 2, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 13,320 lbs., fat 547.5 lbs., test 4.11 per cent.

Feed (lbs.): Pasture 159 (days); cornmeal 631; silage 7,495; hay 1,935; bran 9,911; ground oats 1,235; gluten 926; oilmeal 251; soiling crops 620; vitez 115; corn stover 1,685.

R. O. P. 309—Snowball: Gr. Holstein; 2 yrs.; fresh May 9, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 9,652 lbs., fat 387.7 lbs., test 4.02 per cent.

Feed (lbs.): Pasture 122 (days); pea vines 1,830; shorts 160; green corn 1,810; cornmeal 43; Schumacher 58; hominy 110; hay 644; gluten 653; ground oats 1,051; bran 728; alfalfa 1,149; cottonseed meal 64; oilmeal 265; silage 6,770.

R. O. P. 310—Pauline: Gr. Holstein; 5 yrs.; fresh Sept. 26, 1917 and Nov. 23, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 16,836 lbs., fat 570.8 lbs., test 3.39 per cent.

Feed (lbs.): Pasture 122 (days); pea vines 1,830; shorts 387; green corn 1,810; ground corn 285; hominy 76; beets 90; gluten 860; ground oats 1,429; bran 1,061; hay 1,433; cottonseed meal 106; oilmeal 444; silage 7,525.

R. O. P. 311—Princess: Gr. Holstein; 5 yrs.; fresh Sept. 16, 1917 and Oct. 7, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 14,364 lbs., fat 523.3 lbs., test 3.64 per cent.

Feed (lbs.): Pasture 122 (days); pea vines 1,830; shorts 153; alfalfa 714; green corn 1,810; ground corn 201; hominy 85; fl. grain 164; gluten 821; ground oats 1,370; bran 948; silage 7,385; cottonseed meal 107; oilmeal 411; hay 1,028; Schumacher 68.

R. O. P. 312—Lily: Gr. Holstein; 6 yrs.; fresh June 18, 1917 and May 20, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 13,009 lbs., fat 472.2 lbs., test 3.63 per cent.

Feed (lbs.): Pasture 122 (days); pea vines 1,830; shorts 51; cornmeal 87; green corn 1,810; alfalfa 1,576; hominy 99; shorts 63; fl. grain 117; gluten 788; ground oats 1,259; bran 890; cottonseed meal 98; oilmeal 284; silage 6,770.

R. O. P. 313—Dot: Gr. Holstein; 8 yrs.; fresh April 14, 1918 and Jan. 28, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 13,971 lbs., fat 592.5 lbs., test 4.24 per cent.

Feed (lbs.): Pasture 152 (days); pea vines 1,830; alfalfa 1,149; green corn 1,810; middlings 128; fl. grain 131; hominy 137; ground corn 204; gluten 868; ground oats 1,305; bran 930; shorts 43; hay 644; schumacher 62; cottonseed meal 103; oilmeal 362; silage 7,075.

R. O. P. 314—Spot: Gr. Holstein; 3 yrs.; fresh April, 1918 and Mar. 27, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 11,393 lbs., fat 475.5 lbs., test 4.17 per cent.

Feed (lbs.): Pasture 122 (days); pea vines 1,830; shorts 84; cornmeal 130; green corn 1,810; hay 644; Schumacher 88; hominy 110; fl. grain 169; gluten 737; ground oats 704; beets 1,097; bran 756; alfalfa 1,149; cottonseed meal 96; oilmeal 264; silage 6,920.

R. O. P. 356—Aggie: Gr. Holstein; 5 yrs.; fresh Mar. 2, 1917 and Oct. 17, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 16,916 lbs., fat 667.7 lbs., test 3.95 per cent.

Feed (lbs.): Pasture 122 (days); pea vines 1,830; shorts 76; hay 644; green corn 1,810; ground corn 295; hominy 55; beets 90; fl. grain 165; gluten 938; ground oats 1,470; bran 1,083; silage 7,525; cottonseed meal 102; middlings 93; oilmeal 465; alfalfa 1,433.

R. O. P. 357—Pietertje Maid Pontiac Johanna, 352,389: Reg. Holstein; 2 yrs.; fresh Feb. 12, 1918 and March 8, 1919. record from July 1, 1918 to July 1, 1919.

Production: Milk 14,338 lbs., fat 486.4 lbs., test 3.39 per cent.

Feed (lbs.): Pasture 122 (days); pea vines 930; shorts 43; cornmeal 199; green corn 1,810; hay 417; Schumacher 88; hominy 110; middlings 39; fl. grain 173; gluten 779; ground oats 1,206; bran 889; beets 90; alfalfa 1,149; cottonseed meal 106; oilmeal 307; silage 6,920.

R. O. P. 358—Pietertje Maid Aggie Johanna, 95,532: Reg. Holstein; 11 yrs.; fresh Dec. 16, 1917 and Mar. 12, 1919. record from July 1, 1918 to July 1, 1919.

Production: Milk 15,488 lbs., fat 591.0 lbs., test 3.35 per cent.

Feed (lbs.): Pasture 122 (days); pea vines 1,830; shorts 82; beets 222; green corn 1,810; cornmeal 139; hominy 135; fl. grain 47; gluten 820; ground oats 1,267; bran 986; alfalfa 1,079; cottonseed meal 118; oilmeal 317; silage 6,890.

R. O. P. 359—Klazerina Boelyn, 3rd, 333,132: Reg. Holstein; 2 yrs.; fresh April 14, 1918; record from July 1, 1918 to July 1919.

Production: Milk 10,199 lbs., fat 394.0 lbs., test 3.86 per cent.

Feed (lbs.): Pasture 122 (days); pea vines 1,200; shorts 51; hay 714; green corn 1,810; cornmeal 112; hominy 136; middlings 63; fl. grain 30; Schumacher 96; gluten 730; ground oats 1,241; bran 908; alfalfa 862; cottonseed meal 78; oilmeal 337; silage 6,150.

R. O. P. 360—Princess Colantha Piebe, 230,595: Reg. Holstein; 5 yrs.; fresh March 16, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 10,622 lbs., fat 377.9 lbs., test 3.56 per cent.

Feed (lbs.): Pasture 30 (days); silage 6,920; green corn 1,810; middlings 39; fl. grain 109; Schumacher 101; gluten 598; ground oats 987; bran 780; oilmeal 316; alfalfa 1,149; shorts 51; cottonseed meal 166; hay 644; beets 160.

Kolste, Arthur, Cedar Grove.

R. O. P. 332—Lady: Gr. Holstein; 3 yrs.; fresh Nov. 17, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 10,828 lbs., fat 412.2 lbs., test 3.81 per cent.

Feed (lbs.): Pasture 122 (days); green corn 3,783; silage 6,040; gluten 910; bran 850; oilmeal 151; sucrene 360; grain ration 124.

R. O. P. 333—Blossom: Gr. Holstein; 5 yrs.; fresh Mar. 22, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 11,957 lbs., fat 412.8 lbs., test 3.45 per cent.

Feed (lbs.): Pasture 122 (days); ground oats 68; green corn 3,783; gluten 1,068; vitez 47; bran 939; oilmeal 169; ground corn 120; sucrene 186; grain ration 124; silage 6,040.

R. O. P. 344—Niger: Native; 7 yrs.; fresh Oct. 23, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 11,106 lbs., fat 483.9 lbs., test 4.36 per cent.

Feed (lbs.): Pasture 122 (days); green corn 3,783; ground oats 120; gluten 970; bran 970; oilmeal 181; silage 6,040; sucrene 360; grain ration 124.

Laarman, Garret, Oostburg.

R. O. P. 346—No. 6: Native. 5 yrs.; fresh Feb. 17, 1918 and Feb. 3, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 9,627 lbs., fat 367.7 lbs., test 3.82 per cent.

Feed (lbs.): Pasture 97 (days); hay 1,615; silage 5,754; hominy 8; bran 367; gluten 857; ground oats 1,524; green corn 1,549; wild hay 287; oilmeal 169; ground corn 254.

Lohuis, William, Oostburg.

R. O. P. 215—Spottie: Gr. Holstein; 6 yrs.; fresh Feb. 20, 1917 and Feb. 13, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 13,518 lbs., fat 427.9 lbs., test 3.18 per cent.

Feed (lbs.): Pasture 168 (days); grain mixture 316; silage 280; hay 1,696; ground oats 1,330; gluten 884; corn stover 250; soiling crops 770; oilmeal 250; bran 272; barley 65; cottonseed meal 171.

R. O. P. 295—Bessie 3rd: Gr. Holstein; 4 yrs.; fresh April 15, 1917 and May, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 11,776 lbs., fat 391.0 lbs., test 3.32 per cent.

Feed (lbs.): Grain mixture 522; silage 6,189; hay 1,665; ground oats 5,113; gluten 1,812; soiling crops 1,025; oilmeal 145; bran 159; barley 76; cottonseed meal 58.

R. O. P. 296—Belle: Gr. Holstein; 4 yrs.; fresh Feb. 20, 1917 and Feb. 3, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 12,161 lbs., fat 381.0 lbs., test 3.13 per cent.

Feed (lbs.): Pasture 168 (days); grain mixture 424; silage 6,420; hay 1,665; ground oats 1,147; gluten 848; soiling crops 1,025; oilmeal 245; bran 366; barley 50; cottonseed meal 184.

R. O. P. 297—Bessie: Gr. Holstein; 6 yrs.; fresh Mar. 6, 1917 and Mar. 24, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 12,573 lbs., fat 464.3 lbs., test 3.69 per cent.

Feed (lbs.): Pasture 288 (days); grain mixture 538; silage 6,280; hay 1,696; ground oats 1,245; gluten 967; soiling crops 250; oilmeal 775; bran 215; barley 99; cottonseed meal 91.

R. O. P. 328—Beauty: Gr. Holstein; 3 yrs.; fresh May 25, 1918; record from July 1, 1917 to July 1, 1918.

Production: Milk 15,434 lbs., fat 582.6 lbs., test 3.78 per cent.

Feed (lbs.): Pasture 122 (days); green corn 1,694; silage 6,910; bran 699; Schumacher 904; hominy 37; barley 285; gluten 917; cottonseed meal 72; distillers' grain 134; oat feed 77; oilmeal 193; ground oats 1,044.

R. O. P. 330—Bessie 3rd: Gr. Holstein; 5 yrs.; fresh May 7, 1918 and June 6, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 14,612 lbs., fat 522.0 lbs., test 3.57 per cent.

Feed (lbs.): Pasture 122 (days); green corn 1,694; silage 6,910; bran 649; Schumacher 74; hay 904; hominy 37; barley 235; gluten 746; cottonseed meal 77; oat feed 77; distillers' grain 201; oilmeal 179; ground oats 1,093.

R. O. P. 352—Lady Johanna Witt De Kol, 348,912: Reg. Holstein; 2 yrs.; fresh Aug. 24, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 13,832 lbs., fat 428.6 lbs., test 3.10 per cent.

Feed (lbs.): Pasture 122 (days); green corn 1,694; silage 6,910; bran 611; cornmeal 40; hay 848; gluten 735; distillers' grain 134; oilmeal 196; ground oats 1,018; barley 285.

R. O. P. 353—Johanna Elmen Rue 2nd, 321,158: Reg. Holstein; 3 yrs.; fresh Dec., 1918 and Jan. 28, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 13,480 lbs., fat 482.6 lbs., test 3.58 per cent.

Feed (lbs.): Pasture 210 (days); silage 3,280; alfalfa 2,340; mixed hay Schumacher 74; hay 904; hominy 37; barley 392; gluten 810; cottonseed meal 90; oat feed 54; distillers' grain 182; oilmeal 181; ground oats 1,197.

R. O. P. 354—Spottie: Gr. Holstein; 7 yrs.; fresh Feb. 13, 1918 and Feb. 8, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 15,996 lbs., fat 547.7 lbs., test 3.42 per cent.

Feed (lbs.): Pasture 122 (days); green corn 1,694; silage 6,910; bran 739; Schumacher 74; hay 904; hominy 37; barley 368; gluten 847; cottonseed meal 90; cornmeal 56; distillers' grain 170; oilmeal 183; ground oats 1,221.

Neerhof, Mrs. C. J., Oostburg.

R. O. P. 355—Rose: Native; 6 yrs.; fresh May 10, 1918 and Jan. 24, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 10,925 lbs., fat 418.5 lbs., test 3.83 per cent.

Feed (lbs.): Pasture 122 (days); silage 4,888; green corn 4,178; gluten 808; bran 759; oat feed 186; straw 186; oilmeal 181; mixed hay 453; alfalfa 236; ground oats 921.

Neerhof, D. W., Oostburg.

R. O. P. 334—Bessie Segis Burg, 270,265: Reg. Holstein; 3 yrs.; fresh Feb. 12, 1918 and Feb. 28, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 10,715 lbs., fat 384.6 lbs., test 3.59 per cent.

Feed (lbs.): Pasture 122 (days); ground oats 329; hay 1,965; vitex 2,101; ground corn 1,426; gluten 177; linseed meal 48; pea vines 863; alfalfa 367.

Nyhof, William, Cedar Grove.

R. O. P. 292—Madge: Gr. Holstein; 6 yrs.; fresh Jan. 24, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 15,640 lbs., fat 554.1 lbs., test 3.54 per cent.

Feed (lbs.): Pasture 107 (days); grain mixture 1,904; silage 10,910; hay 868; middlings and Wisconsin balanced ration 295; gluten 1,875; oilmeal 493; pea vine silage and beans 446; bran and cottonseed meal 264; germ meal 279; ground oats 1,960.

R. O. P. 293—Maggie: Gr. Holstein; 5 yrs.; fresh Feb. 18, 1917 and Feb. 1, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 10,326 lbs., fat 400.5 lbs., test 3.88 per cent.

Feed (lbs.): Pasture 92 (days); grain mixture 613; Wisconsin balanced ration 186; silage 9,880; hay 868; middlings 78; gluten feed 1,298; oilmeal 107; pea vines 400; silage 46; beans and bran 140; ground oats 1,930; straw 1,550.

R. O. P. 294—Nigger: Gr. Holstein; 7 yrs.; fresh Dec., 1916 and Oct. 20, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 12,743 lbs., fat 441.8 lbs., test 3.47 per cent.

Feed (lbs.): Pasture 107 (days); Wisconsin balanced ration 186; cottonseed meal 124; grain mixture 613; silage 9,880; hay 868; middlings 78; gluten 1,293; oilmeal 200; pea vine silage 400; beans 46; bran 140; ground oats 1,930; straw 1,550.

Van Driest, Mrs. J. and Sons, Oostburg.

R. O. P. 339—Star: Gr. Holstein; 4 yrs.; fresh Mar. 28, 1918 and Apr. 10, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 11,412 lbs., fat 370.1 lbs., test 3.24 per cent.

Feed (lbs.): Pasture 92 (days); green corn 3,726; pea vines 1,400; alfalfa 1,621; gluten 1,135; vitex 100; straw 90; silage 4,881; hay 195; ground oats 790; barley 39; bran 680; oilmeal 315.

R. O. P. 342—Niggie: Gr. Holstein; 8 yrs.; fresh Dec. 31, 1917 and Dec. 30, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 12,808 lbs., fat 459.8 lbs., test 3.58 per cent.

Feed (lbs.): Pasture 122 (days); green corn 3,558; straw 90; pea vines 1,400; alfalfa 2,230; gluten 1,198; vitex 100; cottonseed meal 24; silage 5,321; hay 195; ground oats 1,599; ground barley 366; oilmeal 380; bran 788.

R. O. P. 343—Seven: Gr. Holstein; 7 yrs.; fresh Aug. 24, 1917 and Oct. 2, 1918; record from July 1, 1918 to July 1, 1919.

Production: Milk 14,284 lbs., fat 539.3 lbs., test 3.78 per cent.

Feed (lbs.): Pasture 92 (days); green corn 5,451; straw 90; barley 327; gluten 1,221; cottonseed meal 24; ground oats 1,461; bran 942; alfalfa 2,230; silage 5,496; oilmeal 533.

Wieberdink, Harry, Oostburg.

R. O. P. 304—Molly: Native; 4 yrs.; fresh April 10, 1918 and Mar. 19, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 11,159 lbs., fat 391.4 lbs., test 3.51 per cent.

Feed (lbs.): Pasture 122 (days); silage 4,046; hay 1,501; green corn 1,909; alfalfa 124; ground oats 837; gluten 1,240; shorts 40; green oats 353; climax 252; straw 596; sucrose 74; balanced ration 147.

R. O. P. 305—Babe: Gr. Holstein; 5 yrs.; fresh June 1, 1918 and April 5, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 13,266 lbs., fat 400.7 lbs., test 3.02 per cent.

Feed (lbs.): Pasture 122 (days); silage 4,046; green corn 1,909; alfalfa 24; ground oats 998; gluten 1,405; shorts 40; bran 831; oilmeal 104; hay 1,284; straw 596; balanced ration 78.

R. O. P. 345—Flossy: Gr. Holstein; $\frac{7}{8}$ yrs.; fresh Feb. 19, 1918 and Feb. 11, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 11,560 lbs., fat 374.8 lbs., test 3.24 per cent.

Feed (lbs.): Pasture 122 (days); silage 4,166; hay 217; climax 252; green corn 372; oilmeal 62; bran 774; gluten 1,405; ground oats 948; hay 1,284; straw 596; sucrose 136; balanced ration 171.

DODGE COUNTY ASSOCIATION

Fehr, Max, Horicon.

R. O. P. 31—Hasel: Gr. Holstein; 7 yrs.; fresh Dec. 10, 1916 and Nov. 1, 1917; record from March 1, 1917 to March 1, 1918.

Production: Milk 10,058 lbs., fat 419.5 lbs., test 4.06 per cent.

Feed (lbs.): Pasture 162 (days); timothy hay 1,530; mixed feed 1,869; corn stover 1,417; corn silage 4,910; mixed hay 1,237; pea silage 1,685; oilmeal 59.

R. O. P. 32—Lady: Gr. Holstein; 5 yrs.; fresh May 4, 1916 and June 7, 1917; record from March 1, 1917 to March 1, 1918.

Production: Milk 10,011 lbs., fat 407.0 lbs., test 4.04 per cent.

Feed (lbs.): Pasture 162 (days); timothy hay 1,530; mixed feed 1,548; corn stover 1,696; corn silage 4,910; mixed hay 1,237; oilmeal 59; pea silage 1,645.

Hanefeld, Alfred, Burnett Junction.

R. O. P. 362—Belle: Gr. Holstein; 2 yrs.; fresh April 21, 1918; record from April 1, 1918 to April 1, 1919.

Production: Milk 11,747 lbs., fat 405.1 lbs., test 3.45 per cent.

Feed (lbs.): Pasture 184 (days); corn silage 7,100; mixed feed 2,389; mixed hay 1,938.

R. O. P. 363—Beattie: Gr. Holstein; 4 yrs.; fresh April 2, 1918 and Jan. 20, 1919; record from April 1, 1918 to April 1, 1919.

Production: Milk 10,895 lbs., fat 409.7 lbs., test 3.76 per cent.

Feed (lbs.): Pasture 184 (days); corn silage 7,100; mixed feed 2,489; mixed hay 1,938.

Kanzanbach, William, Horicon.

R. O. P. 25—Flora: Gr. Holstein; 2 yrs.; fresh Feb. 10, 1917 and April 15, 1918; record from March 1, 1917 to March 1, 1918.

Production: Milk 9,959 lbs., fat 373.3 lbs., test 3.8 per cent.

Feed (lbs.): Pasture 176 (days); corn silage 6,224; mixed hay 1,885; mixed feed 2,128; green corn 300; clover hay 967; corn stover 240; pea silage 1,609.

R. O. P. 26—Nellie: Gr. Holstein; 6 yrs.; fresh Nov. 10, 1916 and Oct. 28, 1917; record from March 1, 1917 to March 1, 1918.

Production: Milk 12,371 lbs., fat 420.0 lbs., test 3.43 per cent.

Feed (lbs.): Pasture 175 (days); corn silage 6,224; mixed hay 1,075; mixed feed 445; green corn 510; clover hay 967; corn stover 240; pea silage 1,609.

R. O. P. 27—Maggie: Gr. Holstein; 5 yrs.; fresh Oct. 10, 1916 and Oct. 6, 1917; record from March 1, 1917 to March 1, 1918.

Production: Milk 11,297 lbs., fat 397.0 lbs., test 3.59 per cent.

Feed (lbs.): Pasture 175 (days); corn silage 6,224; mixed hay 1,075; mixed feed 2,620; green corn 300; clover hay 967; corn stover 240; pea silage 1,609.

R. O. P. 28—Fannie: Gr. Holstein; 8 yrs.; fresh Jan. 10, 1917 and Dec. 22, 1918; record from March 1, 1917 to March 1, 1918.

Production: Milk 11,552 lbs., fat 428.6 lbs., test 3.87 per cent.

Feed (lbs.): Pasture 175 (days); corn silage 6,224; mixed hay 1,385; mixed feed 2,481; green corn 300; clover hay 657; corn stover 240; pea silage 1,609.

R. O. P. 29—Elsie: Gr. Holstein; 3 yrs.; fresh Jan. 10, 1917 and Dec. 15, 1917; record from March 1, 1917 to March 1, 1918.

Production: Milk 11,506 lbs., fat 366.1 lbs., test 3.34 per cent.

Feed (lbs.): Pasture 175 (days); corn silage 6,224; mixed hay 1,385; mixed feed 2,584; green corn 300; clover hay 657; corn stover 240; pea silage 1,609.

R. O. P. 30—Lillie: Gr. Holstein; 7 yrs.; fresh Mar. 10, 1917 and Aug. 23, 1918; record from March 1, 1917 to March 1, 1918.

Production: Milk 10,889 lbs., fat 382.1 lbs., test 3.59 per cent.

Feed (lbs.): Pasture 175 (days); corn silage 6,224; mixed hay 1,075; mixed feed 2,244; green corn 300; clover hay 967; corn stover 240; pea silage 1,609.

Kanzanbach, Karl, Burnett.

R. O. P. No. 5: Gr. Holstein; 8 yrs.; fresh Dec. 2, 1916 and Nov. 22, 1917; record from March 1, 1917 to March 1, 1918.

Production: Milk 9,215 lbs., fat 382.7 lbs., test 4.21 per cent.

Feed (lbs.): Pasture 160 (days); corn silage 6,345; timothy hay 828; mixed feed 1,577; clover hay 2,033; corn fodder 868; pea silage 1,950; oilmeal 186.

R. O. P. 34—No. 11: Gr. Holstein; 8 yrs.; fresh Dec. 14, 1916 and Nov. 25, 1917; record from March 1, 1917 to March 1, 1918.

Production: Milk 11,475 lbs., fat 390.8 lbs., test 3.58 per cent.

Feed (lbs.): Pasture 159 (days); corn silage 6,345; timothy hay 828; mixed feed 1,825; clover hay 2,033; corn fodder 868; pea silage 1,950; oilmeal 186.

Luck, Theodore, Horicon.

R. O. P. 58—Nellie: Gr. Holstein; 9 yrs.; fresh Feb. 5, 1917 and Jan. 12, 1918; record from March 1, 1917 to March 1, 1918.

Production: Milk 10,534 lbs., fat 367.9 lbs., test 3.92 per cent.

Feed (lbs.): Pasture 153 (days); corn silage 5,796; alfalfa hay 539; clover hay 2,256; mixed feed 3,332; pea silage 850.

R. O. P. 59—Johanna Canary Paul, 232,593: Reg. Holstein; 3 yrs.; fresh Oct. 6, 1916 and Dec. 14, 1917; record from March 1, 1917 to March 1, 1918.

Production: Milk 11,454 lbs., fat 409.4 lbs., test 3.67 per cent.

Feed (lbs.): Pasture 153 (days); corn silage 5,796; alfalfa hay 539; clover hay 2,256; mixed feed 3,325; pea silage 850.

R. O. P. 60—Baby: Gr. Holstein; 9 yrs.; fresh Dec. 4, 1916 and Nov. 15, 1919; record from March 1, 1917 to March 1, 1918.

Production: Milk 10,297 lbs., fat 426.5 lbs., test 4.12 per cent.

Feed (lbs.): Pasture 152 (days); corn silage 5,796; alfalfa hay 539; clover hay 2,256; mixed feed 2,918; pea silage 850.

R. O. P. 61—Daisy: Gr. Holstein; 5 yrs.; fresh Oct. 1, 1916 and Nov. 20, 1917; record from March 1, 1917 to March 1, 1918.

Production: Milk 10,054 lbs., fat 431.9 lbs., test 4.36 per cent.

Feed (lbs.): Pasture 153 (days); corn silage 5,796; alfalfa hay 539; clover hay 2,256; mixed feed 2,956; pea silage 850.

Rusch, Ed., Horicon.

R. O. P. 36—No. 7: Gr. Holstein; 8 yrs.; fresh May 5, 1917 and Feb. 2, 1918; record from March 1, 1917 to March 1, 1918.

Production: Milk 11,043 lbs., fat 417.7 lbs., test 3.71 per cent.

Feed (lbs.): Pasture 175 (days); corn silage 4,612; timothy hay 700; mixed feed 1,746; clover hay 2,223; corn stover 549; pea silage 2,170.

Seering, Louis, Burnett Junction.

R. O. P. 364—Brush: Gr. Holstein; 5 yrs.; fresh Feb. 2, 1918 and Jan. 2, 1919; record from March 1, 1918 to March 1, 1919.

Production: Milk 9,100 lbs., fat 370.4 lbs., test 4.07 per cent.

Feed (lbs.): Pasture 159 (days); corn silage 4,921; mixed feed 1,408; mixed hay 2,153.

Zimmerman, Carl, Burnett.

R. O. P. 35—Nichtern: Holstein; 6 yrs.; fresh Oct. 17, 1916 and Sept. 22, 1917; record from March 17, 1917 to March 17, 1918.

Production: Milk 10,228 lbs., fat 408.0 lbs., test 4.4 per cent.

Feed (lbs.): Pasture 168 (days); corn silage 7,639; timothy hay 675; ground oats 471; clover hay 1,030; mixed feed 1,926; oilmeal 62; pea silage 620.

DODGEVILLE ASSOCIATION

Huson, W. L., Dodgeville.

R. O. P. 55—Topsy: Gr. Holstein; 8 yrs.; fresh Feb. 10, 1917 and Dec. 27, 1917; record from May 22, 1917 to May 22, 1918.

Production: Milk 10,507 lbs., fat 389.1 lbs., test 3.70 per cent.

Feed (lbs.): Pasture 199 (days); corn silage 5,311; hay 2,800; mixed feed 2,022.

R. O. P. 56—Hannah: Gr. Holstein; 8 yrs.; fresh July 22, 1917; record from May 22, 1917 to May 22, 1918.

Production: Milk 9,372 lbs., fat 381.6 lbs., test 4.07 per cent.

Feed (lbs.): Pasture 198 (days); corn silage 5,981; hay 3,280; mixed feed 2,037.

R. O. P. 57—Frances: Gr. Holstein; 6 yrs.; fresh Mar. 11, 1917 and Mar. 6, 1918; record from May 22, 1917 to May 22, 1918.

Production: Milk 11,417 lbs., fat 371.5 lbs., test 3.28 per cent.

Feed (lbs.): Pasture 199 (days); corn silage 5,981; hay 3,280; mixed feed 2,428.

DOOR COUNTY ASSOCIATION

Marten, Chas. F., Egg Harbor.

R. O. P. 190—Beauty: Native; 4 yrs.; fresh Oct. 5, 1917 and Nov. 11, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 8,381 lbs., fat 384.8 lbs., test 4.6 per cent.

Feed (lbs.): Pasture 163 (days); silage 5,400; hay 1,800; grain 1,540.

Marten, Fred, Egg Harbor.

R. O. P. 187—Spottie: Gr. Holstein; 4 yrs.; fresh Mar. 9, 1917 and Feb. 20, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 10,037 lbs., fat 378.6 lbs., test 3.76 per cent.

Feed (lbs.): Pasture 184 (days); silage 4,740; hay 1,780; grain 2,731.

R. O. P. 188—Nellie: Gr. Holstein; 4 yrs.; fresh April 9, 1917 and April 25, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 12,987 lbs., fat 490.2 lbs., test 3.8 per cent.

Feed (lbs.): Pasture 184 (days); silage 5,340; hay 1,800; grain 2,584.

R. O. P. 189—Daisy: Gr. Guernsey; 2 yrs.; fresh April 2, 1917 and Feb. 14, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 8,325 lbs., fat 364.1 lbs., test 4.37 per cent.

Feed (lbs.): Pasture 184 (days); silage 4,740; hay 1,480; grain 1,757.

R. O. P. 191—Sallie: Native; 8 yrs.; fresh Dec. 15, 1916 and Oct. 21, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 10,647 lbs., fat 420.1 lbs., test 3.9 per cent.

Feed (lbs.): Pasture 184 (days); silage 5,340; hay 1,800; grain 2,395.

DUNN COUNTY NO. 2 ASSOCIATION

Coolidge, D. C., Downing.

R. O. P. 368—No. 32: Gr. Holstein; 7 yrs.; fresh Aug., 1918; record from April 1, 1918 to April 1, 1919.

Production: Milk 9,237 lbs., fat 383.6 lbs., test 4.19 per cent.

Feed (lbs.): Pasture 145 (days); hay 2,884 silage 7,980; grain 2,145.

Gillis, Frank, Glenwood City.

R. O. P. 369—Maplerun Butter Boy Daisy, 213,663: Reg. Holstein; 5 yrs.; fresh Jan. 9, 1918 and Oct. 23, 1916; record from April 1, 1918 to April 1, 1919.

Production: Milk 12,018 lbs., fat 412.2 lbs., test 3.42 per cent.

Feed (lbs.): Pasture 198 (days); hay 2,162; ensilage 5,410; grain 772.

Hall Estate, Inc., Knapp.

R. O. P. 248—Sunshine of Brookside, 201,448: Reg. Jersey; 11 yrs.; fresh Sept. 21, 1915 and Oct. 23, 1916; record from Nov. 1, 1916 to Nov. 1, 1917.

Production: Milk 8,613 lbs., fat 426.4 lbs., test 4.95 per cent.

Feed (lbs.): Pasture 168 (days); silage 3,687; clover 1,342; shorts 1,409; mixed hay 733; oats 389; barley 850.

Hausman, Harry, Knapp.

R. O. P. 365—Mutual Johanna of Rock, 198,574: Reg. Holstein; 8 yrs.; fresh June 19, 1918 and Mar. 20, 1919; record from April 1, 1918 to April 1, 1919.
Production: Milk 10,774 lbs., fat 382.9 lbs., test 3.5 per cent.
Feed (lbs.): Pasture 183 (days); hay 3,120; silage 7,320; grain 2,826.

Radtke, E. H., Downing.

R. O. P. 366—Star: Gr. Holstein; 9 yrs.; fresh Oct. 2, 1918; record from April 1, 1918 to April 1, 1919.

Production: Milk 11,483 lbs., fat 462.4 lbs., test 4.06 per cent.

Feed (lbs.): Pasture 184 (days); hay 2,132; ensilage 8,412; grain 1,959.

R. O. P. 367—Daisy: Gr. Holstein; 6 yrs.; fresh Sept. 24, 1918; record from April 1, 1918 to April 1, 1919.

Production: Milk 8,703 lbs., fat 388.7 lbs., test 4.46 per cent.

Feed (lbs.): Pasture 214 (days); hay 2,132; ensilage 8,162; grain 1,618.

EAU CLAIRE COUNTY ASSOCIATION

Strader, H. B., Augusta.

R. O. P. 46—; Native; 8 yrs.; fresh Nov. 20, 1916 and May 12, 1918; record from Dec. 28, 1916 to Dec. 28, 1917.

Production: Milk 9,530 lbs., fat 412.2 lbs., test 4.32 per cent.

Feed (lbs.): Pasture 168 (days); hay 3,145; silage 4,017; bran 832; int. s. f. 337; oats 152; oilmeal 31.

EDGAR-MARATHON ASSOCIATION

Baumann, C. J., Marathon

R. O. P. 124—Rose: Gr. Guernsey; 7 yrs.; fresh Feb. 7, 1917 and Feb. 20, 1918; record from August 1, 1917 to August 1, 1918.

Production: Milk 7,533.5 lbs., fat 395.9 lbs., test 5.25 per cent.

Feed (lbs.): Pasture 153 (days); silage 5,398; clover and alfalfa hay 2,738; grain 149; roots 1,189; oilmeal 6.

Hart Bros., Edgar.

R. O. P. 122—Kitty G: Gr. Holstein; 5 yrs.; fresh Jan. 9, 1917 and Nov. 29, 1917; record from August 1, 1917 to August 1, 1918.

Production: Milk 12,120 lbs., fat 369.8 lbs., test 3.45 per cent.

Feed (lbs.): Pasture 137 (days); hay 2,191; silage 5,945; grain 2,521.

R. O. P. 123—Juamie: Gr. Holstein; 3 yrs.; fresh Oct. 10, 1916 and Dec. 28, 1917; record from Aug. 1, 1917 to Aug. 1, 1918.

Production: Milk 10,888 lbs., fat 377 lbs., test 3.46 per cent.

Feed (lbs.): Pasture 137 (days); hay 1,988; silage 5,007; grain 2,343.

Volhard, Anton, Marathon.

R. O. P. 118—Daisy: Gr. Holstein; 7 yrs.; fresh Aug. 28, 1916 and Sept. 4, 1917; record from August 1, 1917 to August 1, 1918.

Production: Milk 10,688 lbs., fat 403.5 lbs., test 3.8 per cent.

Feed (lbs.): Pasture 138 (days); hay 3,412; roots 448; grain 2,455; silage 5,632.

FORT ATKINSON ASSOCIATION

Burchard and Peters, Fort Atkinson.

R. O. P. 421—Alta: Gr. Guernsey; 5 yrs.; fresh Oct. 27, 1918; record from May 1, 1918 to May 1, 1919.

Production: Milk 7,999 lbs., fat 393.7 lbs., test 4.92 per cent.

Feed (lbs.): Pasture 131 (days); silage 4,810; hay 1,819; grain 985; oilmeal 173.

R. O. P. 422—Cora: Gr. Guernsey; 5 yrs.; fresh Sept. 28, 1918; record from May 1, 1918 to May 1, 1919.

Production: Milk 8,100 lbs., fat 367.7 lbs., test 4.54 per cent.

Feed (lbs.): Pasture 131 (days); silage 5,140; hay 1,919; grain 1,135; oilmeal 173.

R. O. P. 423—Hattie: Gr. Holstein; age unknown; fresh Sept. 28, 1918; record from May 1, 1918 to May 1, 1919.

Production: Milk 7,997 lbs., fat 406 lbs., test 5.07 per cent.

Feed (lbs.): Pasture 161 (days); silage 5,140; hay 1,919; grain 1,187; oil-meal 143.

Hoffman and Erdman, Fort Atkinson.

R. O. P. 424—Dairy Maid: Gr. Guernsey; 6 yrs.; fresh Aug. 9, 1917 and Sept., 1918; record from April 26, 1918 to April 26, 1919.

Production: Milk 7,906 lbs., fat 379.3 lbs., test 4.79 per cent.

Feed (lbs.): Pasture 161 (days); silage 6,575; hay 1,280; grain 2,171; oil-meal 144.

R. O. P. 425—Daisy: Gr. Guernsey; 3 yrs.; fresh Sept. 15, 1918 and Sept. 4, 1917; record from April 1, 1918 to April 1, 1919.

Production: Milk 7,672 lbs., fat 376.7 lbs., test 4.91 per cent.

Feed (lbs.): Pasture 161 (days); silage 6,575; hay 1,280; grain 1,921; oil-meal 144.

Main, H. A., Fort Atkinson.

R. O. P. 426—Buttercup: Gr. Guernsey; 5 yrs.; fresh Dec., 1917 and Jan. 5, 1919; record from May 1, 1918 to May 1, 1919.

Production: Milk 8,216 lbs., fat 379.5 lbs., test 4.62 per cent.

Feed (lbs.): Silage 12,185; hay 2,623; grain 1,251; oilmeal 15.

R. O. P. 427—Dairymaid: Gr. Guernsey; 8 yrs.; fresh Dec., 1917 and Nov. 7, 1918; record from May 1, 1918 to May 1, 1919.

Production: Milk 8,604 lbs., fat 412.9 lbs., test 4.79 per cent.

Feed (lbs.): Silage 11,735; hay 2,533; grain 1,491; oilmeal 15.

L. B. Royce Estate, Fort Atkinson.

R. O. P. 428—Lady Taft of Denmark, 42,126: Reg. Guernsey; 6 yrs.; fresh Dec., 1917 and Oct. 28, 1918; record from May 1, 1918 to May 1, 1919.

Production: Milk 7,521 lbs., fat 395.6 lbs., test 5.25 per cent.

Feed (lbs.): Silage 11,735; hay 2,263; oilmeal 15; grain 1,947.

Stevens, M. B., Route 3, Jefferson.

R. O. P. 429—Black Princess De Kol 2nd, 225,836: Reg. Holstein; 4 yrs.; fresh Oct. 17, 1918 and Feb. 27, 1919; record from May 1, 1918 to May 1, 1919.

Production: Milk 9,206 lbs., fat 371.2 lbs., test 4.03 per cent.

Feed (lbs.): Pasture 115 (days); silage 7,460; hay 995; grain 2,499.

Telfer, F. M., Fort Atkinson.

R. O. P. 430—Rose: Gr. Guernsey; 8 yrs.; fresh March 25, 1919; record from May 1, 1918 to May 1, 1919.

Production: Milk 7,957 lbs., fat 405.6 lbs., test 5.09 per cent.

Feed (lbs.): Pasture 153 (days); silage 10,695; hay 900; corn stover 1,200; grain 480.

Trieloff, Wm. and Son, Fort Atkinson.

R. O. P. 431—No. 1: Gr. Holstein; 6 yrs.; fresh Nov. 15, 1918; record from May 1, 1918 to May 1, 1919.

Production: Milk 9,810 lbs., fat 380.9 lbs., test 3.88 per cent.

Feed (lbs.): Pasture 153 (days); silage 9,455; hay 1,499; oilmeal 212; mixed grain 1,267.

HAVEN AND CLEVELAND ASSOCIATION

Hallwachs, Fred, Route 1, Sheboygan.

R. O. P. 272—No. 4: Gr. Holstein; 8 yrs.; fresh Sept. 18, 1917 and Sept. 6, 1918; record from Oct. 16, 1917 to Oct. 16, 1918.

Production: Milk 10,610 lbs., fat 395 lbs., test 3.72 per cent.

Feed (lbs.): Pasture 153 (days); corn silage 7,272; clover hay 2,644; victor feed 2,060.

Ochs, Fred, Route 2, Sheboygan.

R. O. P. 266—Wilmas's Gwendoline, 282,443: Reg. Jersey; 5 yrs.; fresh Nov. 14, 1917; record from Oct. 18, 1917 to Oct. 18, 1918.

Production: Milk 6,960 lbs., fat 375 lbs., test 5.39 per cent.
Feed (lbs.): Pasture 184 (days); corn silage 5,818; clover and alfalfa hay 2,170; oilmeal 1,600.

R. O. P. 267—Nigger: Gr. Jersey; 2 yrs.; fresh Oct. 4, 1917; record from Oct. 4, 1917 to Oct. 4, 1918.

Production: Milk 8,268 lbs., fat 392 lbs., test 4.74 per cent.
Feed (lbs.): Pasture 168 (days); corn silage 5,818; clover and alfalfa hay 2,170; oilmeal 1,031.

R. O. P. 268—Mully: Native; 10 yrs.; fresh Nov. 8, 1917; record from Oct. 17, 1917 to Oct. 18, 1918.

Production: Milk 8,049 lbs., fat 382 lbs., test 4.75 per cent.
Feed (lbs.): Pasture 184 (days); corn silage 5,818; clover and alfalfa hay 2,170; oilmeal 1,515.

R. O. P. 269—Mahle: Gr. Jersey; 7 yrs.; fresh Sept. 18, 1918; record from Oct. 18, 1917 to Oct. 18, 1918.

Production: Milk 8,286 lbs., fat 438 lbs., test 5.29 per cent.
Feed (lbs.): Pasture 184 (days); corn silage 5,818; clover and alfalfa hay 2,170; oilmeal 1,299.

R. O. P. 270—Lulu: Gr. Jersey; 7 yrs.; fresh Jan. 21, 1918; record from Oct. 18, 1917 to Oct. 18, 1918.

Production: Milk 8,124 lbs., fat 489 lbs., test 5.36 per cent.
Feed (lbs.): Pasture 184 (days); corn silage 5,818; clover and alfalfa hay 2,170; oilmeal 1,446.

R. O. P. 271—Jersey: Gr. Jersey; 3 yrs.; fresh Jan. 22, 1918; record from Oct. 18, 1917 to Oct. 18, 1918.

Production: Milk 8,885 lbs., fat 395 lbs., test 4.45 per cent.
Feed (lbs.): Pasture 184 (days); corn silage 5,818; clover and alfalfa hay 2,170; oilmeal 1,296.

Prange and Wippermann, Route 1, Sheboygan.

R. O. P. 273—Pearl Longfield Pont'ac De Kol, 282,126: Reg. Holstein; 3 yrs.; fresh Dec. 5, 1917 and Oct. 22, 1916; record from Oct. 15, 1917 to Oct. 15, 1918.

Production: Milk 15,691 lbs., fat 516 lbs., test 3.29 per cent.
Feed (lbs.): Pasture 170 (days); corn silage 4,559; alfalfa hay 3,595; mixed feed 3,701.

R. O. P. 274—Little Gift Spofford, 138,272: Reg. Holstein; 7 yrs.; fresh Feb. 11, 1916 and Dec. 9, 1917; record from Oct. 15, 1917 to Oct. 15, 1918.

Production: Milk 11,245 lbs., fat 392 lbs., test 3.49 per cent.
Feed (lbs.): Pasture 170 (days); corn silage 4,755; alfalfa hay 3,595; mixed feed 3,639.

R. O. P. 275—Govers Wisconsin Maid, 206,349: Reg. Holstein; 4 yrs.; fresh Feb. 11, 1917 and Dec. 16, 1917; record from Oct. 15, 1917 to Oct. 15, 1918.

Production: Milk 16,484 lbs., fat 495 lbs., test 3.0 per cent.
Feed (lbs.): Pasture 170 (days); corn silage 4,615; alfalfa hay 3,595; mixed feed 3,358.

R. O. P. 276—Rigtje Houwtje Lady, 258,812: Reg. Holstein; 3 yrs.; fresh Feb. 13, 1917 and Dec. 26, 1917; record from Oct. 15, 1917 to Oct. 15, 1918.

Production: Milk 10,676 lbs., fat 412 lbs., test 3.86 per cent.
Feed (lbs.): Pasture 170 (days); corn silage 4,615; alfalfa hay 3,595; mixed feed 2,758.

R. O. P. 277—Neeltje Bell Ormsby De Kol, 235,395: Reg. Holstein; 4 yrs.; fresh May 2, 1918 and June 21, 1917; record from Oct. 15, 1917 to Oct. 15, 1918.

Production: Milk 10,978 lbs., fat 408 lbs., test 3.72 per cent.
Feed (lbs.): Pasture 170 (days); corn silage 4,615; alfalfa hay 3,595; mixed feed 1,332.

R. O. P. 278—Hickory Grove Wonder 2nd, 235,912: Reg. Holstein; 3 yrs.; fresh Feb. 3, 1918 and Mar. 1, 1917; record from Oct. 15, 1917 to Oct. 15, 1918.

Production: Milk 10,603 lbs., fat 420 lbs., test 3.96 per cent.
Feed (lbs.): Pasture 170 (days); corn silage 4,615; alfalfa hay 3,595; mixed feed 2,306.

R. O. P. 279—Pearl Spofford 2nd, 263,644: Reg. Holstein; 3 yrs.; fresh Nov. 28, 1917 and Feb. 5, 1917; record from Oct. 15, 1917 to Oct. 15, 1918.

Production: Milk 11,295 lbs., fat 396 lbs., test 3.51 per cent.
Feed (lbs.): Pasture 170 (days); corn silage 4,615; alfalfa hay 3,595; mixed feed 3,189.

Wunsch, Hugo E., Route 1, Sheboygan.

R. O. P. 263—Susy: Gr. Guernsey; 5 yrs.; fresh Feb. 2, 1918; record from Oct. 9, 1917 to Oct. 9, 1918.

Production: Milk 8,453 lbs., fat 434 lbs., test 5.13 per cent.

Feed (lbs.): Pasture 151 (days); corn silage 7,000; clover hay 2,355; mixed feed 2,739.

R. O. P. 264—Rose: Gr. Guernsey; 6 yrs.; fresh Jan. 31, 1918; record from Oct. 9, 1917 to Oct. 9, 1918.

Production: Milk 10,108 lbs., fat 394 lbs., test 3.9 per cent.

Feed (lbs.): Pasture 151 (days); corn silage 7,000; clover hay 2,200; mixed feed 2,608.

R. O. P. 265—Belle of Haven, 21,793: Reg. Guernsey; 9 yrs.; fresh Sept. 20, 1917; record from Oct. 9, 1917 to Oct. 9, 1918.

Production: Milk 6,869 lbs., fat 386 lbs., test 5.62 per cent.

Feed (lbs.): Pasture 151 (days); corn silage 7,200; clover hay 2,435; mixed feed 2,967.

HORICON ASSOCIATION

Kanzanbach, William, Horicon.

R. O. P. 370—Pearl No. 19: Gr. Holstein; 4 yrs.; fresh Jan. 5, 1918 and Jan. 1, 1919; record from April 1, 1918 to April 1, 1919.

Production: Milk 12,897 lbs., fat 427.3 lbs., test 3.31 per cent.

Feed (lbs.): Pasture 169 (days); corn silage 6,698; mixed feed 2,855; clover hay 540; pea silage 1,290; mixed hay 968.

R. O. P. 371—Lucy No. 21: Gr. Holstein; 4 yrs.; fresh Feb. 15, 1918 and Jan. 12, 1919; record from April 1, 1918 to April 1, 1919.

Production: Milk 11,689 lbs., fat 403.6 lbs., test 3.45 per cent.

Feed (lbs.): Pasture 169 (days); corn silage 6,698; mixed feed 2,664; clover hay 540; pea silage 1,590; mixed hay 968.

R. O. P. 372—Julia No. 4: Gr. Holstein; 9 yrs.; fresh April 23, 1918 and April 2, 1919; record from April 1, 1918 to April 1, 1919.

Production: Milk 10,786 lbs., fat 399 lbs., test 3.69 per cent.

Feed (lbs.): Pasture 169 (days); corn silage 6,698; mixed feed 2,590; clover hay 540; pea silage 1,590; mixed hay 968.

R. O. P. 373—Roxy No. 18: Gr. Holstein; 4 yrs.; fresh Dec. 30, 1917 and Jan. 29, 1919; record from April 1, 1918 to April 1, 1919.

Production: Milk 13,339 lbs., fat 422.9 lbs., test 3.17 per cent.

Feed (lbs.): Pasture 169 (days); corn silage 6,698; mixed feed 2,774; clover hay 540; pea silage 1,590; mixed hay 968.

KEWAUNEE COUNTY ASSOCIATION

Chevreny, Matt, Kewaunee.

R. O. P. 16—Betty: Gr. Holstein; 6 yrs.; fresh Dec. 11, 1916; record from Dec. 1, 1916 to Dec. 1, 1917.

Production: Milk 9,664 lbs., fat 391.3 lbs., test 4.04 per cent.

Feed (lbs.): Pasture 167 (days); silage 4,005; timothy 2,662; oilmeal 242; brewers' grain and ground oats 2,582.

Glandt, Robert C., Route 1, Kewaunee.

R. O. P. 19—Spot: Gr. Jersey; 6 yrs.; fresh Oct. 19, 1916 and Oct. 13, 1917; record from Dec. 19, 1916 to Dec. 19, 1917.

Production: Milk 8,206 lbs., fat 385.2 lbs., test 4.71 per cent.

Feed (lbs.): Pasture 129 (days); silage 4,321; mixed hay 2,518; mixed grain 2,515.

Kassner, Henry, Route 6, Kewaunee.

R. O. P. 13—Grace: Gr. Holstein; 7 yrs.; fresh Jan. 15, 1917; record from Dec. 1, 1916 to Dec. 1, 1917.

Production: Milk 8,949 lbs., fat 394.31 lbs., test 4.41 per cent.

Feed (lbs.): Pasture 163 (days); silage 5,473; timothy 2,314; mixed grain 1,430.

R. O. P. 14—Henrietta: Gr. Holstein; 5 yrs.; fresh Dec. 12, 1916; record from Dec. 1, 1916 to Dec. 1, 1917.

Production: Milk 8,821 lbs., fat 400.4 lbs., test 4.54 per cent.

Feed (lbs.): Pasture 163 (days); silage 5,480; timothy 1,996; mixed grain 1,781.

Olson, Anton L., Route 1, Kewaunee.

R. O. P. 18—Maude: Gr. Guernsey; 13 yrs.; fresh Dec. 9, 1916; record from Dec. 1, 1916 to Dec. 1, 1917.

Production: Milk 8,147 lbs., fat 380.3 lbs., test 4.66 per cent.

Feed (lbs.): Pasture 183 (days); silage 5,160; straw 310; mixed grain 1,582.

Olson, Charlie, Kewaunee.

R. O. P. 17—Topsy: Gr. Jersey; 8 yrs.; fresh Dec. 26, 1917; record from Dec. 1, 1916 to Dec. 1, 1917.

Production: Milk 7,915 lbs., fat 403.0 lbs., test 5.03 per cent.

Feed (lbs.): Pasture 154 (days); silage 5,887; timothy 1,599; alfalfa 182; mixed grain 1,230.

Peterson, Charlie, Kewaunee.

R. O. P. 20—Jessie: Native; 10 yrs.; fresh Mar. 13, 1917; record from Dec. 1, 1916 to Dec. 1, 1917.

Production: Milk 7,033 lbs., fat 431.2 lbs., test 6.36 per cent.

Feed (lbs.): Pasture 182 (days); silage 6,222; mixed hay 1,464; mixed grain 299.

Wishka, James, Kewaunee.

R. O. P. 15—Julia of Maple Lane, 2nd, 145,425: Reg. Holstein; 6 yrs.; fresh Oct. 10, 1916 and Sept. 1, 1917; record from December 1, 1916 to December 1, 1917.

Production: Milk 10,559 lbs., fat 373.5 lbs., test 3.53 per cent.

Feed (lbs.): Pasture 182 (days); silage 2,690; hay 2,065; brewers' grain and bran 1,992.

LA CROSSE COUNTY ASSOCIATION

Anderson, Albert, Route 2, Holmen.

R. O. P. 178—Spottie: Gr. Jersey; 11 yrs.; fresh Oct. 25, 1916; record from Nov. 1, 1916 to Nov. 1, 1917.

Production: Milk 8,148 lbs., fat 372.1 lbs., test 4.59 per cent.

Feed (lbs.): Pasture 187 (days); silage 5,640; hay 2,270; grain 1,476.

Drogseth, Evan, Route 2, Holmen.

R. O. P. 177—Freckle: Gr. Guernsey; 9 yrs.; fresh Feb. 16, 1917 and Nov. 25, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 9,786 lbs., fat 405.9 lbs., test 4.15 per cent.

Feed (lbs.): Pasture 167 (days); silage 5,205; hay 1,215; corn stover 410; grain 779.

Knudson, Emil, Route 2, Holmen.

R. O. P. 175—Julia: Gr. Guernsey; 7 yrs.; fresh Nov. 5, 1916 and Dec. 9, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 8,488 lbs., fat 366.6 lbs., test 4.32 per cent.

Feed (lbs.): Pasture 168 (days); silage 6,929; hay 1,798; corn stover 120; grain 1,609.

R. O. P. 176—Nannette of Seven Elms Farm, 50,239: Reg. Guernsey; 4 yrs.; fresh Mar. 22, 1917 and Mar. 2, 1918; record from April 1, 1917 to April 1, 1918.

Production: Milk 6,530 lbs., fat 384.8 lbs., test 5.3 per cent.

Feed (lbs.): Pasture 168 (days); silage 5,939; hay 1,828; corn stover 120; grain 1,323.

Libakken, Mandly, Route 2, Holmen.

R. O. P. 171—Beauty: Gr. Guernsey; 7 yrs.; fresh May 27, 1916; record from April 1, 1917 to April 1, 1918.

Production: Milk 7,921 lbs., fat 386 lbs., test 4.86 per cent.

Feed (lbs.): Pasture 152 (days); silage 7,510; hay 1,950; corn stover 155; grain 556.

R. O. P. 172—Lady of Hillside: Gr. Guernsey; 8 yrs.; fresh Nov. 11, 1916 and Nov. 1, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 9,317 lbs., fat 419.8 lbs., test 4.51 per cent.

Feed (lbs.): Pasture 152 (days); silage 7,510; hay 1,950; corn stover 155; grain 834.

R. O. P. 173—Rose: Gr. Guernsey; 8 yrs.; fresh Oct. 20, 1916 and Nov. 2, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 9,648 lbs., fat 427.2 lbs., test 4.43 per cent.

Feed (lbs.): Pasture 152 (days); silage 7,540; hay 1,950; corn stover 155; grain 780.

R. O. P. 174—Bell: Gr. Guernsey; 3 yrs.; fresh; record from April 1, 1917 to April 1, 1918.

Production: Milk 7,449 lbs., fat 374.6 lbs., test 5.03 per cent.

Feed (lbs.): Pasture 152 (days); silage 7,510; hay 1,950; grain 699.

Lupie, Freeman E., R.F.D. 3, La Crosse.

R. O. P. 170—Jennie, No. 16: Native; age unknown; fresh Feb. 2, 1917 and Jan. 16, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 7,544 lbs., fat 383.1 lbs., test 5.08 per cent.

Feed (lbs.): Pasture 168 (days); silage 3,598; hay 1,516; grain 1,131.

LEON VALLEY ASSOCIATION

Poss, Jacob L., Melvina.

R. O. P. 249—Pride: Gr. Holstein; 6 yrs.; fresh April 21, 1916 and August 20, 1917; record from April 22, 1917 to April 22, 1918.

Production: Milk 8,978 lbs., fat 387.2 lbs., test 4.31 per cent.

Feed (lbs.): Pasture 142 (days); hay 3,000; silage 6,150; Schumacher 180; oats 540; Wisconsin balanced ration 2,140.

Selbach, Frank, Sparta.

R. O. P. 80—Nig: Gr. Holstein; 9 yrs.; fresh Dec. 23, 1916 and Dec. 22, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 9,967 lbs., fat 404.8 lbs., test 4.06 per cent.

Feed (lbs.): Pasture 183 (days); corn silage 5,550; mixed hay 1,650; mixed grain 2,060.

LINDINA ASSOCIATION

Clark, Dan T., Route 2, Union Center.

R. O. P. 81—Pride: Gr. Jersey; 5 yrs.; fresh April 8, 1916 and Oct. 21, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 7,397 lbs., fat 426.0 lbs., test 5.7 per cent.

Feed (lbs.): Pasture 143 (days); corn silage 4,232; mixed hay 2,430; grain mixture 1,211; ground oats 187.

LINN ASSOCIATION

Robinson, M. A., Lake Geneva.

R. O. P. 1—Blue Dickinson: Gr. Holstein; 6 yrs.; fresh Sept. 7, 1916; record from June 10, 1916 to June 10, 1917.

Production: Milk 9,215 lbs., fat 368.9 lbs., test 4.0 per cent.

Feed (lbs.): Pasture 183 (days); silage 4,951; corn fodder 2,520; gluten 430; clover 2,154; brewers' grain 732.

MANITOWOC COUNTY ASSOCIATION

Casper, John, Valders.

R. O. P. 111—Nigger: Gr. Holstein; 7 yrs.; fresh Mar. 13, 1917 and Jan. 23, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 8,213 lbs., fat 421.7 lbs., test 5.13 per cent.

Feed (lbs.): Pasture 180 (days); silage 5,805; hay 2,192; straw 950; grain mixture 1,188.

R. O. P. 112—Nellie: Native; 6 yrs.; fresh Nov. 5, 1916 and Nov. 22, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 8,186 lbs., fat 421.9 lbs., test 5.15 per cent.

Feed (lbs.): Pasture 164 (days); silage 6,810; hay 2,406; grain mixture 2,006.

Geraldson, Morton L., Manitowoc.

R. O. P. 183—Pinery Ormsby Pietertje, 250,698: Reg. Holstein; 3 yrs.; fresh Jan. 24, 1917 and Jan. 12, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 10,892 lbs., fat 385.1 lbs., test 3.54 per cent.

Feed (lbs.): Pasture 183 (days); silage 6,270; hay 1,770; oilmeal 148; grain mixture 1,845.

R. O. P. 184—Canary Mechthilde Princess, 192,218: Reg. Holstein; 5 yrs.; fresh Feb. 6, 1917 and Feb. 3, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 9,998 lbs., fat 480.9 lbs., test 4.81 per cent.

Feed (lbs.): Pasture 183 (days); silage 6,800; hay 1,770; oilmeal 88; grain mixture 1,639.

R. O. P. 185—Canary Mercedes Maud, 189,782: Reg. Holstein; 5 yrs.; fresh Feb. 16, 1917 and Jan. 19, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 10,141 lbs., fat 386.6 lbs., test 3.81 per cent.

Feed (lbs.): Pasture 180 (days); silage 6,970; hay 1,770; oilmeal 128; grain mixture 1,603.

R. O. P. 186—Lahiga Fancy, 3rd, 206,973: Reg. Holstein; 4 yrs.; fresh ———; record from May 1, 1917 to May 1, 1918.

Production: Milk 10,448 lbs., fat 403.3 lbs., test 3.86 per cent.

Feed (lbs.): Pasture 180 (days); silage 6,970; hay 1,770; oilmeal 168; grain mixture 1,920.

Gutschow, Ernst, Route 1, Kiel.

R. O. P. 84—Queen: Gr. Holstein; 6 yrs.; fresh Jan. 31, 1917 and Jan. 4, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 10,270 lbs., fat 402.6 lbs., test 3.9 per cent.

Feed (lbs.): Pasture 174 (days); silage 6,755; hay 1,317; oilmeal 380; grain mixture 1,060.

Kelley, William, Timothy.

R. O. P. 121—Armsdale Butter Pauline, 208,172: Reg. Holstein; 4 yrs.; fresh April 7, 1917 and April 12, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 11,537 lbs., fat 416.4 lbs., test 3.61 per cent.

Feed (lbs.): Pasture 196 (days); silage 4,798; hay 1,938; straw 1,315; gluten 120; grain mixture 1,070.

R. O. P. 125—Blacky: Gr. Holstein; 10 yrs.; fresh May 1, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 9,476 lbs., fat 366.5 lbs., test 3.9 per cent.

Feed (lbs.): Pasture 196 (days); silage 1,798; hay 1,938; straw 1,315; gluten 120; grain mixture 1,050.

R. O. P. 182—Careme Wa Wa De Kol 2nd, 207,899: Reg. Holstein; 4 yrs.; fresh Mar. 2, 1917 and Mar. 16, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 11,268 lbs., fat 357.4 lbs., test 3.2 per cent.

Feed (lbs.): Pasture 196 (days); silage 4,798; hay 1,938; straw 1,315; gluten 120; grain mixture 1,070.

Klann, Adolph, Reedsville.

R. O. P. 105—Twin City: Gr. Guernsey; 6 yrs.; fresh Feb. 17, 1917 and Dec. 23, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 7,911 lbs., fat 417.0 lbs., test 5.27 per cent.

Feed (lbs.): Pasture 210 (days); silage 3,280; alfalfa hay 2,260; mixed hay and silage 1,410; gluten 40; middlings 240; cottonseed meal 252; bran 276; grain 328.

R. O. P. 106—M'ss Fox: Gr. Guernsey; 6 yrs.; fresh Mar. 18, 1917 and Jan. 30, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 7,281 lbs., fat 426.2 lbs., test 5.85 per cent.

Feed (lbs.): Pasture 200 (days); silage 1,780; alfalfa 1,760; mixed hay and silage 2,460; cottonseed meal 40; middlings 136; bran 286; grain 584.

R. O. P. 107—Rosholt: Gr. Guernsey; 8 yrs.; fresh April 19, 1917 and Mar. 20, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 7,190 lbs., fat 393.9 lbs., test 5.5 per cent.

Feed (lbs.): Pasture 200 (days); silage 2,280; alfalfa 1,960; mixed hay and silage 1,830; middlings 40; gluten 40; cottonseed meal 111; bran 368; grain 240.

R. O. P. 108—Cream City: Gr. Guernsey; 8 yrs.; fresh Nov. 20, 1916 and Nov. 28, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 8,314 lbs., fat 445 lbs., test 5.48 per cent.

Feed (lbs.): Pasture 210 (days); silage 3,280; alfalfa 2,340; mixed hay and silage 1,410; gluten 40; middlings 250; cottonseed meal 286; bran 140; grain 404.

Knutson, Ed. A., Route 4, Manitowoc.

R. O. P. 51—Jane II: Gr. Guernsey; 6 yrs.; fresh Sept. 16, 1916 and Oct. 6, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 6,791 lbs., fat 375.1 lbs., test 5.52 per cent.

Feed (lbs.): Pasture 210 (days); silage 9,080; hay 2,604; grain mixture 1,621.

McCulley, Charles J., Route 3, Reedsville.

R. O. P. 82—Pauline Burke Gelschecola, 206,625: Reg. Holstein; 4 yrs.; fresh Dec. 23, 1916 and Dec. 4, 1917; record from May, 1917 to April, 1918

Production: Milk 10,602 lbs., fat 361 lbs., test 3.41 per cent.
Feed (lbs.): Pasture 73 (days); silage 5,520; hay 1,976; bran 150; grain mixture 2,075.

Pinter, John, Cleveland.

R. O. P. 179—Starry: Gr. Holstein; 5 yrs.; fresh Nov. 15, 1916 and Nov. 28, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 9,107 lbs., fat 391.8 lbs., test 4.30 per cent.
Feed (lbs.): Pasture 165 (days); silage 7,303; hay 1,690; grain mixture 1,516.

R. O. P. 180—Favorite: Gr. Holstein; 6 yrs.; fresh Dec. 25, 1916 and Dec. 14, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 11,344 lbs., fat 429.9 lbs., test 3.79 per cent.
Feed (lbs.): Pasture 165 (days); silage 7,303; hay 1,690; grain mixture 1,501.

R. O. P. 181—Mully: Native; 11 yrs.; fresh July 6, 1916 and June 1, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 8,363 lbs.; fat 395.2 lbs., test 4.73 per cent.
Feed (lbs.): Pasture 165 (days); silage 7,303; hay 1,690; grain mixture 737.

Pritzl, John, Cato.

R. O. P. 92—Murlottie: Gr. Guernsey; 7 yrs.; fresh Sept. 5, 1916 and Aug. 10, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 7,026 lbs., fat 375.9 lbs., test 5.35 per cent.
Feed (lbs.): Pasture 153 (days); silage 7,256; hay 2,320; beets 900; bran 350; oilmeal 162; grain 1,185.

R. O. P. 93—Butterfloss: Gr. Guernsey; 6 yrs.; fresh Dec. 25, 1916 and Dec. 15, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 9,084 lbs., fat 414.8 lbs., test 4.56 per cent.
Feed (lbs.): Pasture 153 (days); silage 7,256; hay 2,320; beets 1,200; oilmeal 217; grain 1,717.

Rogne, Otto, Cato.

R. O. P. 83—Clara, 44,145: Reg. Guernsey; 5 yrs.; fresh Oct. 25, 1916 and Oct. 17, 1917; record from May 1, 1917 to May 1, 1918.

Production: Milk 8,433 lbs., fat 373.3 lbs., test 4.4 per cent.
Feed (lbs.): Pasture 168 (days); silage 8,223; hay 1,442; grain mixture 225.

Wagner, Albert, Valders.

R. O. P. 94—Moose: Gr. Durham; age unknown; fresh Feb. 20, 1917 and Jan. 29, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 8,986 lbs., fat 383.5 lbs., test 4.27 per cent.
Feed (lbs.): Pasture 164 (days); silage 5,289; hay 2,829; grain mixture 1,080.

R. O. P. 95—Jessie: Gr. Holstein; 4 yrs.; fresh Feb. 4, 1917 and Jan. 1, 1918; record from May 1, 1917 to May 1, 1918.

Production: Milk 10,039 lbs., fat 389.9 lbs., test 3.88 per cent.
Feed (lbs.): Pasture 164 (days); silage 5,799; hay 2,827; grain 210.

MARSHALL ASSOCIATION

Budig, William, Cottage Grove.

R. O. P. 47—Jessey Rose: Gr. Guernsey; 8 yrs.; fresh Nov. 2, 1917; record from June 16, 1917 to June 16, 1918.

Production: Milk 9,377 lbs., fat 368.3 lbs., test 3.92 per cent.
Feed (lbs.): Pasture 153 (days); clover hay 2,452; corn silage 4,803; green corn 606; corn stover 1,250; cottonseed meal 105; oats 593; oilmeal 85.

Peck, Henry, Marshall.

R. O. P. 50—Lucyra Pontiac Marguerite, 211,767: Reg. Holstein; 4 yrs.; fresh April 13, 1916 and Sept. 11, 1917; record from Sept. 14, 1917 to June 17, 1918.

Production: Milk 11,953 lbs., fat 418 lbs., test 3.5 per cent.
Feed (lbs.): Pasture 55 (days); alfalfa hay 265; corn silage 6,010; corn fodder 2,500; mangels 4,815; clover hay 3,352; grain mixture 2,121; corn stover 325.

Peck, M. F. and Sons, Marshall.

R. O. P. 96—Lady Pontiac Pansy, 163,796: Reg. Holstein; 6 yrs.; fresh Nov. 29, 1916 and Nov. 18, 1917; record from June 17, 1917 to June 17, 1918.

Production: Milk 14,062 lbs., fat 514.8 lbs., test 3.66 per cent.
Feed (lbs.): Pasture 153 (days); clover hay 2,626; corn silage 8,678; grain mixture 3,053; green corn 600; mangels 1,530; corn fodder 600; marsh hay 155.

R. O. P. 91—Daisy De Kol: Gr. Holstein; 5 yrs.; fresh Oct. 14, 1916 and Sept. 25, 1917; record from June 1, 1917 to June 1, 1918.

Production: Milk 10,972 lbs., fat 378.3 lbs., test 3.45 per cent.

Feed (lbs.): Pasture 188 (days); clover hay 1,866; corn silage 6,960; oats 628; bran 937; oilmeal 71; int. d. feed 180; cottonseed meal 217; screenings 60.

R. O. P. 97—Colanthus Queen Johanna, 198,151: Reg. Holstein; 6 yrs.; fresh Sept. 25, 1916 and Oct. 2, 1917; record from June 1, 1917 to June 1, 1918.

Production: Milk 11,975 lbs., fat 383 lbs., test 3.2 per cent.

Feed (lbs.): Pasture 188 (days); clover hay 1,866; corn silage 6,960; oats 683; bran 702; dairy feed 150; cottonseed meal 217; oilmeal 40; screenings 60.

MILLTOWN ASSOCIATION

Jensen, O. T., Milltown.

R. O. P. 232—Daisy Bell of Oakland, 31,845: Reg. Guernsey; 7 yrs.; fresh Oct. 15, 1916 and Oct. 19, 1917; record from Oct. 1, 1917 to Oct. 1, 1918.

Production: Milk 9,503 lbs., fat 411.8 lbs., test 4.22 per cent.

Feed (lbs.): Pasture 153 (days); hay 2,875; silage 6,150; corn silage 1,230; grain 2,270.

MISHICOT ASSOCIATION

Hessel, Robert, Manitowoc.

R. O. P. 44—Flossy: Gr. Holstein; 6 yrs.; fresh Nov. 12, 1917 and Jan. 5, 1917; record from Feb. 25, 1917 to Feb. 25, 1918.

Production: Milk 8,982 lbs., fat 391.6 lbs., test 4.26 per cent.

Feed (lbs.): Pasture 165 (days); silage and cutfeed 7,730; hay 1,055; cutfeed 408; silage 1,590; oilmeal 42; gluten feed 63; unicorn 262; grain mixture 1,454; sprouts 107.

R. O. P. 45—Spot: Gr. Holstein; 5 yrs.; fresh Jan. 11, 1917 and Nov. 23, 1917; record from Feb. 25, 1917 to Feb. 25, 1918.

Production: Milk 10,128 lbs., fat 384.6 lbs., test 3.72 per cent.

Feed (lbs.): Pasture 165 (days); silage and cutfeed 7,735; hay 1,055; cutfeed 408; silage 1,590; oilmeal 36; gluten feed 24; unicorn 238; grain 1,392; sprouts 107.

MONDOVI ASSOCIATION

Armour, W. and Son, Mondovi.

R. O. P. 385—No. 16: Gr. Jersey; 10 yrs.; fresh Nov. 3, 1917 and Oct. 20, 1918; record from Aug. 1, 1918 to Aug. 1, 1919.

Production: Milk 6,658 lbs., fat 372.9 lbs., test 5.6 per cent.

Feed (lbs.): Silage 5,817; hay 1,218; grain 3,778.

R. O. P. 98—Queen Johanna Lula, 150,723: Reg. Holstein; 7 yrs.; fresh Dec. 24, 1916 and Dec. 27, 1917; record from June 17, 1917 to June 17, 1918.

Production: Milk 13,032 lbs., fat 387.1 lbs., test 2.97 per cent.

Feed (lbs.): Pasture 153 (days); clover hay 2,626; corn silage 8,678; grain mixture 2,347; green corn 600; mangels 1,230; corn fodder 600; marsh hay 155.

R. O. P. 99—Baker Mercedes 2nd, 212,519: Reg. Holstein; 4 yrs.; fresh Oct. 7, 1916 and Sept. 9, 1917; record from June 17, 1917 to June 17, 1918.

Production: Milk 11,873 lbs., fat 389.8 lbs., test 3.29 per cent.

Feed (lbs.): Pasture 153 (days); clover hay 2,626; corn silage 8,678; grain mixture 2,165; green corn 600; mangels 2,120; marsh hay 600.

R. O. P. 100—Hello Segis Inka, 162,037: Reg. Holstein; 6 yrs.; fresh Oct. 19, 1916; record from June 17, 1917 to June 17, 1918.

Production: Milk 10,748 lbs., fat 395.3 lbs., test 3.68 per cent.

Feed (lbs.): Pasture 153 (days); clover hay 2,626; corn silage 8,678; grain mixture 2,209; green corn 600; mangels 2,120; corn fodder 600; marsh hay 155.

White, Lewis C., Marshall.

R. O. P. 87—Colanthus De Kol: Gr. Holstein; 7 yrs.; fresh Dec. 31, 1916 and Dec. 25, 1917; record from June 1, 1917 to June 1, 1918.

Production: Milk 11,431 lbs., fat 406.1 lbs., test 3.55 per cent.

Feed (lbs.): Pasture 188 (days); clover hay 1,866; corn silage 6,960; oats 553; bran 797; oilmeal 106; international dairy feed 65; cottonseed meal 177; screenings 60.

R. O. P. 88—Black Beauty: Gr. Holstein; 7 yrs.; fresh Oct. 12, 1916 and Oct. 11, 1917; record from June 1, 1917 to June 1, 1918.

Production: Milk 13,796 lbs., fat 485.8 lbs., test 3.52 per cent.

Feed (lbs.): Pasture 188 (days); clover hay 1,866; corn silage 6,960; oats 683; bran 677; oilmeal 45; international dairy feed 135; cottonseed meal 217; screenings 60.

R. O. P. 89—Lady White: Gr. Holstein; 7 yrs.; fresh Sept. 19, 1916; record 1. 1917 to June 1, 1918.

Production: Milk 8,442 lbs., fat 387.7 lbs., test 4.60 per cent.

Feed (lbs.): Pasture 188 (days); clover hay 1,866; corn silage 6,960; oats 652; bran 897; oilmeal 68; international dairy feed 180; cottonseed meal 217; screenings 60.

R. O. P. 90—Flossie Gertrude De Kol, 251,130: Reg. Holstein; 5 yrs.; fresh Jan. 11, 1917 and Nov. 9, 1917; record from June 1, 1917 to June 1, 1918.

Production: Milk 11,718 lbs., fat 396.9 lbs., test 3.38 per cent.

Feed (lbs.): Pasture 188 (days); clover hay 1,866; corn silage 6,960; oats 683; bran 927; oilmeal 101; international dairy feed 105; cottonseed meal 217; screenings 60.

R. O. P. 386—No. 8: Gr. Jersey; 6 yrs.; fresh Dec. 28, 1917 and Nov. 22, 1918; record from Aug. 1, 1918 to Aug. 1, 1919.

Production: Milk 8,321 lbs., fat 424.9 lbs., test 5.11 per cent.

Feed (lbs.): Silage 5,007; hay 1,065; grain 2,486.

R. O. P. 387—Bell Laureat, 2nd: Gr. Jersey; 10 yrs.; fresh Feb. 3, 1917 and Dec. 23, 1918; record from Aug. 1, 1918 to Aug. 1, 1919.

Production: Milk 6,631 lbs., fat 390.7 lbs., test 5.89 per cent.

Feed (lbs.): Silage 4,077; hay 755; grain 2,752.

R. O. P. 388—No. 26: Gr. Jersey; 3 yrs.; fresh July 23, 1918; record from Aug. 1, 1918 to Aug. 1, 1919.

Production: Milk 7,740 lbs., fat 406.4 lbs., test 5.25 per cent.

Feed (lbs.): Silage 5,817; hay 1,185; grain 2,272.

R. O. P. 389—No. 1: Gr. Jersey; 6 yrs.; fresh April 7, 1917 and Oct. 10, 1918; record from Aug. 1, 1918 to Aug. 1, 1919.

Production: Milk 8,341 lbs., fat 405.3 lbs., test 4.86 per cent.

Feed (lbs.): Silage 5,807; hay 6,887 grain 2,483.

Houser, W. L., Mondovi.

R. O. P. 374—No. 3: Gr. Jersey; 5 yrs.; fresh —————; record from Aug. 1, 1918 to Aug. 1, 1919.

Production: Milk 6,743 lbs., fat 386.2 lbs., test 5.72 per cent.

Feed (lbs.): Silage 3,125; hay 496; ground feed 880.

Saxe, Stewart, Mondovi.

R. O. P. 375—No. 11: Gr. Guernsey; 4 yrs.; fresh Feb. 16, 1918 and Feb. 1, 1919; record from Aug. 1, 1918 to Aug. 1, 1919.

Production: Milk 8,416 lbs., fat 424.2 lbs., test 5.04 per cent.

Feed (lbs.): Hay 785; grain 1,343; fodder 491.

R. O. P. 380—No. 12: Gr. Guernsey; 5 yrs.; fresh Dec. 13, 1917 and Nov. 9, 1918; record from Aug. 1, 1918 to August 1, 1919.

Production: Milk 8,200 lbs., fat 383.8 lbs., test 4.68 per cent.

Feed (lbs.): Hay 845; grain 2,122; fodder 863; straw 360.

R. O. P. 381—No. 9: Gr. Guernsey; 6 yrs.; fresh Mar. 15, 1918 and Mar. 13, 1919; record from Aug. 1, 1918 to Aug. 1, 1919.

Production: Milk 9,564 lbs., fat 399.6 lbs., test 4.18 per cent.

Feed (lbs.): Hay 645; grain 475; fodder 527; straw 124.

Seyforth, F. J. and Son, Mondovi.

R. O. P. 382—Pansy: Gr. Jersey; 3 yrs.; fresh Feb. 10, 1919 and Mar. 15, 1918; record from Aug. 1, 1918 to Aug. 1, 1919.

Production: Milk 7,428 lbs., fat 382.0 lbs., test 5.14 per cent.

Feed (lbs.): Silage 5,001; hay 1,179; ground feed 1,428; fodder 124.

R. O. P. 383—Dixie: Gr. Jersey; 4 yrs.; fresh Feb. 12, 1917 and Mar. 15, 1918; record from Aug. 1, 1918 to Aug. 1, 1919.

Production: Milk 7,215 lbs., fat 377.1 lbs., test 5.23 per cent.

Feed (lbs.): Silage 4,700; hay 1,179; ground feed 1,244; fodder 124; dairy feed 184.

R. O. P. 384—Daisy: Gr. Jersey; 6 yrs.; fresh April 13, 1919 and May 13, 1918; record from Aug. 1, 1918 to Aug. 1, 1919.

Production: Milk 7,133 lbs., fat 374.1 lbs., test 5.24 per cent.

Feed (lbs.): Silage 5,193; hay 732; grain 1,065.

MONTICELLO ASSOCIATION

Baumgartner, William C., Monticello.

R. O. P. 169—Prilly Pietertje De Kol, 198,687: Reg. Holstein; 5 yrs.; fresh July 7, 1916 and Nov. 28, 1917; record from April 28, 1917 to April 28, 1918.

Production: Milk 11,366 lbs., fat 386.2 lbs., test 3.39 per cent.

Feed (lbs.): Pasture 168 (days); mixed hay 802; silage 5,460; arcadia 188; oilmeal 52; barley 150; oats 550; bran 513; unicorn 96; Wisconsin balanced ration 316; mixed grains 465.

Hoesly, Baltz, New Glarus.

R. O. P. 153—Tuebie Queen Midget, 190,774: Reg. Holstein; 5 yrs.; fresh April 26, 1917 and May 17, 1918; record from April 3, 1917 to April 3, 1918.

Production: Milk 12,475 lbs., fat 424.1 lbs., test 3.4 per cent.
Feed (lbs.): Pasture 151 (days); silage 7,980; alfalfa 1,570; bran 81; oats 81; hominy 81; gluten 81; oilmeal 81; clover 1,198; Wisconsin balanced ration 207; unicorn 45.

R. O. P. 154—Phroso Homestead 4th, 229,305: Reg. Holstein; 4 yrs.; fresh Mar. 10, 1917 and Mar., 1918; record from April 3, 1917 to April 3, 1918.

Production: Milk 12,186 lbs., fat 377.6 lbs., test 3.1 per cent.
Feed (lbs.): Pasture 184 (days); silage 6,980; alfalfa 1,270; bran 72; barley 108; clover 1,198; Wisconsin balanced ration 93; unicorn 93.

R. O. P. 155—Parthena Homestead, 3rd, 229,296: Reg. Holstein; 4 yrs.; fresh Mar. 5, 1917 and Mar. 24, 1918; record from April 3, 1917 to April 3, 1918.

Production: Milk 10,978 lbs., fat 378.2 lbs., test 3.4 per cent.
Feed (lbs.): Pasture 184 (days); silage 6,980; alfalfa 1,270; bran 72; barley 198; clover 1,198; Wisconsin balanced ration 124; unicorn 124.

R. O. P. 156—Tuebie Midget 4th, 165,859: Reg. Holstein; 6 yrs.; fresh Mar. 7, 1917 and April 24, 1918; record from April 3, 1917 to April 3, 1918.

Production: Milk 11,923 lbs., fat 408.4 lbs., test 3.43 per cent.
Feed (lbs.): Pasture 184 (days); silage 7,180; alfalfa 1,270; bran 108; oats 108; hominy 108; gluten meal 108; oilmeal 108; clover 1,198; Wisconsin balanced ration 50.

R. O. P. 157—Lady Pearl Hengerveld, 147,927: Reg. Holstein; 7 yrs.; fresh May 10, 1917 and May 6, 1918; record from April 3, 1917 to April 3, 1918.

Production: Milk 11,374 lbs., fat 404.6 lbs., test 3.56 per cent.
Feed (lbs.): Pasture 154 (days); silage 7,980; alfalfa 1,570; bran 77; oilmeal 77; oats 77; hominy 77; gluten 77; clover 1,198; Wisconsin balanced ration 107.

R. O. P. 158—Pearl Excetter De Kol Clothilde, 229,298: Reg. Holstein; 4 yrs.; fresh Jan. 15, 1917 and Dec. 24, 1918; record from April 3, 1917 to April 3, 1918.

Production: Milk 11,806 lbs., fat 394.7 lbs., test 3.34 per cent.
Feed (lbs.): Pasture 184 (days); silage 6,980; alfalfa 1,270; bran 72; barley 108; clover 1,198; Wisconsin balanced ration 339; unicorn 93.

R. O. P. 159—Minnehaha Excetter De Kol, 229,302: Reg. Holstein; 4 yrs.; fresh April 16, 1917 and April 12, 1918; record from April 3, 1917 to April 3, 1918.

Production: Milk 13,073 lbs., fat 440.1 lbs., test 3.37 per cent.
Feed (lbs.): Pasture 154 (days); silage 7,980; alfalfa 1,570; bran 196; oats 196; hominy 196; gluten 196; oilmeal 196; clover 1,198; Wisconsin balanced ration 339.

R. O. P. 160—Phroso Homestead 2nd, 149,987: Reg. Holstein; 7 yrs.; fresh May 24, 1917 and May 24, 1918; record from April 3, 1917 to April 3, 1918.

Production: Milk 12,188 lbs., fat 409.4 lbs., test 3.36 per cent.
Feed (lbs.): Pasture 184 (days); silage 6,780; alfalfa 1,270; clover 1,198; Wisconsin balanced ration 339; unicorn 93.

R. O. P. 161—Tuebie Clothilde Midget, 229,292: Reg. Holstein; 4 yrs.; fresh April 23, 1917 and April 23, 1918; record from April 3, 1917 to April 3, 1918.

Production: Milk 12,410 lbs., fat 422.6 lbs., test 3.41 per cent.
Feed (lbs.): Pasture 184 (days); silage 7,180; alfalfa 1,270; bran 30; oats 30; hominy 30; gluten 30; oilmeal 30; clover 1,198; Wisconsin balanced ration 207; unicorn 45.

R. O. P. 162—Midget Piebe Homestead, 165,858: Reg. Holstein; 6 yrs.; fresh Mar. 17, 1917 and April 7, 1918; record from April 3, 1917 to April 3, 1918.

Production: Milk 12,882 lbs., fat 424.8 lbs., test 3.3 per cent.
Feed (lbs.): Pasture 184 (days); silage 7,180; alfalfa 1,270; bran 108; oats 108; hominy 108; gluten 108; oilmeal 108; clover 1,194.

R. O. P. 163—Palmer Piebe De Kol Paul 2nd, 190,772: Reg. Holstein; 6 yrs.; fresh June 13, 1917 and July 21, 1918; record from April 3, 1917 to April 3, 1918.

Production: Milk 10,375 lbs., fat 373.3 lbs., test 3.59 per cent.
Feed (lbs.): Pasture 184 (days); silage 6,780; alfalfa 1,270; barley 108; clover 1,198; Wisconsin balanced ration 339; unicorn 93.

R. O. P. 164—Aunola Homestead De Kol, 229,300: Reg. Holstein; 4 yrs.; fresh Feb. 27, 1917 and Mar. 11, 1918; record from April 3, 1917 to April 3, 1918.

Production: Milk 14,724 lbs., fat 487.5 lbs., test 3.31 per cent.
Feed (lbs.): Pasture 184 (days); silage 6,980; alfalfa 1,270; bran 72; barley 108; clover 1,198; Wisconsin balanced ration 93; unicorn 93.

R. O. P. 165—Minnehaha De Kol 3rd, 149,983: Reg. Holstein; 7 yrs.; fresh April 5, 1917 and April 29, 1918; record from April 3, 1917 to April 3, 1918.

Production: Milk 14,087 lbs., fat 494.7 lbs., test 3.51 per cent.
Feed (lbs.): Pasture 184 (days); silage 7,180; alfalfa 1,270; bran 90; oats 90; hominy 90; gluten meal 90; oilmeal 90; clover 1,198.

R. O. P. 166—Queen Phroso Clothilde, 215,129: Reg. Holstein; 4 yrs.; fresh June 4, 1918 and May 3, 1917; record from April 3, 1917 to April 3, 1918.

Production: Milk 11,897 lbs., fat 453.7 lbs., test 3.81 per cent.
Feed (lbs.): Pasture 153 (days); silage 7,980; alfalfa 1,570; bran 60; oats 60; hominy 60; gluten meal 60; oilmeal 60; Wisconsin balanced ration 1,198; unicorn 207.

R. O. P. 167—Wadmantje Hengerveld De Kol, 215,145: Reg. Holstein; 5 yrs.; fresh Mar. 29, 1917 and April 25, 1918; record from April 3, 1917 to April 3, 1918.

Production: Milk 13,458 lbs., fat 457.9 lbs., test 3.4 per cent.

Feed (lbs.): Pasture 184 (days); silage 7,180; alfalfa 1,270; bran 108; oats 108; hominy 108; gluten 108; oilmeal 108; clover 1,198; Wisconsin balanced ration 134.

R. O. P. 168—Midget Piebe Homestead 2nd, 229,304: Reg. Holstein; 4 yrs.; fresh Mar. 14, 1917; record from April 3, 1917 to April 3, 1918.

Production: Milk 11,613 lbs., fat 409.5 lbs., test 3.52 per cent.

Feed (lbs.): Pasture 184 (days); silage 6,980; alfalfa 1,270; bran 72; barley 108; clover 1,198; Wisconsin balanced ration 339; unicorn 93.

R. O. P. 198—Oso Aunola Homestead De Kol, 115,375: Reg. Holstein; 9 yrs.; fresh Feb. 14, 1917 and May 4, 1918; record from April 3, 1917 to April 3, 1918.

Production: Milk 13,743 lbs., fat 419.4 lbs., test 3.05 per cent.

Feed (lbs.): Pasture 184 (days); silage 7,180; alfalfa 1,270; bran 108; oats 108; hominy 108; gluten meal 108; oilmeal 108; clover 1,198; Wisconsin balanced ration 134.

Klassy, Henry C., Monticello.

R. O. P. 151—Spotted Hip: Gr. Holstein; 4 yrs.; fresh May 2, 1917; record from April 16, 1917 to April 16, 1918.

Production: Milk 11,342 lbs., fat 390.9 lbs., test 3.44 per cent.

Feed (lbs.): Pasture 173 (days); silage 9,020; mixed hay 610; oats 615; alfalfa 800.

Klassy, William, Monticello.

R. O. P. 152—Tapper: Gr. Holstein; 7 yrs.; fresh Jan. 15, 1918; record from April 15, 1917 to April 15, 1918.

Production: Milk 11,034 lbs., fat 399.3 lbs., test 3.61 per cent.

Feed (lbs.): Pasture 184 (days); silage 5,908; alfalfa 1,105; amco 90; oats 876; bran 33; oilmeal 110; clover 705; Wisconsin balanced ration 164.

Marty, Fred, Monticello.

R. O. P. 245—Cornelia Johanna, 198,654: Reg. Holstein; fresh June 3, 1917 and May 24, 1916; record from April 11, 1917 to April 11, 1918.

Production: Milk 11,631 lbs., fat 416.6 lbs., test 3.58 per cent.

Feed (lbs.): Pasture 184 (days); silage 4,605; mixed hay 1,269; amco 166; barley 76; oats 314; bran 916; oilmeal 44; Schumacher 30; cottonseed meal 80; corn 393.

R. O. P. 246—Queen Alcartra Johanna, 171,907: Reg. Holstein; fresh Jan. 4, 1917 and Jan. 7, 1918; record from April 11, 1917 to April 11, 1918.

Production: Milk 10,433 lbs., fat 384.3 lbs., test 3.68 per cent.

Feed (lbs.): Pasture 184 (days); silage 4,846; alfalfa 163; mixed hay 1,269; amco 370; barley 55; oats 215; bran 517; oilmeal 3; cottonseed meal 40.

R. O. P. 247—Zur Johanna Pense, 152,756: Reg. Holstein; 6 yrs.; fresh Feb. 19, 1917 and Mar. 2, 1918; record from April 11, 1917 to April 11, 1918.

Production: Milk 13,454 lbs., fat 473.4 lbs., test 3.52 per cent.

Feed (lbs.): Pasture 184 (days); silage 4,846; alfalfa 380; mixed hay 1,269; amco 260; barley 101; oats 379; oat hay 172; bran 808; oilmeal 35; Schumacher 25; cottonseed meal 95.

Schmid, Christ, Jr., Monticello.

R. O. P. 258—Highland Canary, 151,295: Reg. Holstein; 7 yrs.; fresh Mar. 20, 1917 and April 6, 1918; record from April 12, 1917 to April 12, 1918.

Production: Milk 11,294 lbs., fat 368.1 lbs., test 3.26 per cent.

Feed (lbs.): Pasture 184 (days); silage 2,966; alfalfa 595; bran 437; amco 296; oats 405; diamond feed 87; oilmeal 93; mixed hay 905; corn fodder 1,415.

Strahm, Ernest, Monticello.

R. O. P. 259—Blumy: Gr. Holstein; 4 yrs.; fresh April, 1917 and March. 20, 1918; record from April 20, 1917 to April 20, 1918.

Production: Milk 10,207 lbs., fat 371.6 lbs., test 3.64 per cent.

Feed (lbs.): Pasture 168 (days); silage 4,162; alfalfa 1,302; clover 300; empire feed 360; corn fodder 1,840; oats 184; Wisconsin balanced ration 132; big Q 132; bran 472; barley 153.

R. O. P. 260—Espies 1st: Gr. Holstein; 10 yrs.; fresh Jan., 1917 and Dec. 7, 1918; record from April 20, 1917 to April 20, 1918.

Production: Milk 12,270 lbs., fat 377.8 lbs., test 3.08 per cent.

Feed (lbs.): Pasture 168 (days); silage 4,162; alfalfa 1,302; clover 300; empire feed 330; corn fodder 1,840; oats 278; Wisconsin balanced ration 252; big Q 260; bran 494; barley 254.

R. O. P. 261—Espies 2nd. Gr. Holstein; 8 yrs.; fresh Jan., 1917 and Nov. 30, 1917; record from April 20, 1917 to April 20, 1918.

Production: Milk 11,249 lbs., fat 374.4 lbs., test 3.33 per cent.

Feed (lbs.): Pasture 168 (days); silage 4,162; alfalfa 1,292; clover 300; empire feed 330; corn fodder 1,840; oats 278; Wisconsin balanced ration 252; big Q 260; bran 278; barley 278.

R. O. P. 262—Frietag: Gr. Holstein; 9 yrs.; fresh Feb., 1917 and Mar. 12, 1918; record from April 20, 1917 to April 20, 1918.

Production: Milk 9,854 lbs., fat 377.1 lbs., test 3.83 per cent.

Feed (lbs.): Pasture 168 (days); silage 4,162; alfalfa 1,302; clover 300; empire feed 360; corn fodder 1,840; oats 204; Wisconsin balanced ration 230; big Q 232; bran 492; barley 173.

Zentner, Dick, Monticello.

R. O. P. 150—No. 7: Gr. Holstein; 7 yrs.; fresh Dec. 29, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 12,415 lbs., fat 434.4 lbs., test 3.49 per cent.

Feed (lbs.): Pasture 184 (days); silage 5,175; timothy 1,500; amco 80; Schumacher 80; oats 300; wild hay 310; Wisconsin balanced ration 160; barley 115.

MUSCODA ASSOCIATION

Cooper, Walter, Muscoda.

R. O. P. 21—Sally: Gr. Holstein; 4 yrs.; fresh Feb. 2, 1917 and Jan. 6, 1918; record from April 9, 1917 to April 9, 1918.

Production: Milk 9,707 lbs., fat 377.4 lbs., test 3.88 per cent.

Feed (lbs.): Pasture 101 (days); silage 6,420; alfalfa 360; mixed hay 1,013; unicorn 550; bran 30; big Q 883; fodder 620; mixed feed 540; oilmeal 30.

Rinehart, Percy, Muscoda.

R. O. P. 22—Lilly: Gr. Holstein; 9 yrs.; fresh Nov. 1, 1916 and Jan. 12, 1918; record from April 12, 1917 to April 12, 1918.

Production: Milk 10,050 lbs., fat 429.7 lbs., test 4.27 per cent.

Feed (lbs.): Pasture 161 (days); silage 6,060; alfalfa 360; mixed hay 1,047; unicorn 550; bran 510; big Q 403; fodder 620; mixed grain 570.

R. O. P. 23—Postel: Gr. Holstein; 6 yrs.; fresh Feb. 14, 1917; record from April 12, 1917 to April 12, 1918.

Production: Milk 11,283 lbs., fat 375.0 lbs., test 3.39 per cent.

Feed (lbs.): Pasture 182 (days); silage 5,114; mixed hay 540; mixed grain 1,963; Jersey cream 200; fodder 1,220.

R. O. P. 24—Jersey: Gr. Jersey; 7 yrs.; fresh Feb. 28, 1917; record from April 12, 1917 to April 12, 1918.

Production: Milk 8,421 lbs., fat 383.9 lbs., test 4.52 per cent.

Feed (lbs.): Pasture 172 (days); silage 3,540; mixed hay 540; mixed grain 750; Jersey cream 200; fodder 360.

NEW HOLSTEIN KIEL ASSOCIATION

Drake, Herman, Kiel.

R. O. P. 72—Dirks: Gr. Guernsey; 7 yrs.; fresh Nov. 18, 1917 and Oct. 12, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 8,360 lbs., fat 397.6 lbs., test 4.7 per cent.

Feed (lbs.): Pasture 174 (days); silage 7,725; alfalfa 2,155; clover 275; mixed grain 1,681.

Duecker, H. J., Kiel.

R. O. P. 120—Whitespot: Gr. Guernsey; 8 yrs.; fresh Dec. 15, 1916 and Nov. 28, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 9,516 lbs., fat 438.1 lbs., test 4.6 per cent.

Feed (lbs.): Pasture 153 (days); silage 7,930; clover hay 2,321; mixed grain 2,305.

R. O. P. 128—Fritz: Gr. Guernsey; 10 yrs.; fresh Nov. 3, 1916 and Dec. 18, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 8,718 lbs., fat 384.8 lbs., test 4.46 per cent.

Feed (lbs.): Pasture 153 (days); silage 8,050; clover 2,321; mixed grain 2,290.

R. O. P. 129—Marquardt: Gr. Guernsey; 9 yrs.; fresh Jan. 28, 1917 and Jan. 24, 1918; record from April 1, 1917 to April 1, 1918.

Production: Milk 9,642 lbs., fat 450.4 lbs., test 4.67 per cent.

Feed (lbs.): Pasture 153 (days); silage 7,930; clover 2,321; mixed grain 2,208.

R. O. P. 130—Redback: Gr. Guernsey; 8 yrs.; fresh July 18, 1916 and July 1, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 11,119 lbs., fat 491.2 lbs., test 4.4 per cent.

Feed (lbs.): Pasture 153 (days); silage 8,050; clover 2,321; mixed grain 2,459.

R. O. P. 131—Ladysmith: Gr. Guernsey; 9 yrs.; fresh Mar. 26, 1917 and Feb. 14, 1918; record from April 1, 1917 to April 1, 1918.

Production: Milk 9,405 lbs., fat 449 lbs., test 4.8 per cent.

Feed (lbs.): Pasture 153 (days); silage 7,930; clover hay 2,321; mixed grain 2,239.

R. O. P. 132—Goeres 1st: Gr. Guernsey; 12 yrs.; fresh Jan. 23, 1917 and Dec. 16, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 9,315 lbs., fat 449.3 lbs., test 4.8 per cent.

Feed (lbs.): Pasture 153 (days); silage 7,930; clover hay 2,321; mixed grain 2,230.

R. O. P. 133—Goeres 2nd: Gr. Guernsey; 2 yrs.; fresh Sept. 27, 1916 and Sept. 13, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 7,989 lbs., fat 377.2 lbs., test 4.7 per cent.

Feed (lbs.): Pasture 153 (days); silage 7,424; clover 2,321; mixed grain 2,053.

R. O. P. 134—Golden Lily's Vivian, 52,294: Reg. Guernsey; 3 yrs.; fresh July 11, 1916 and July 24, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 7,231 lbs., fat 388.9 lbs., test 5.4 per cent.

Feed (lbs.): Pasture 153 (days); silage 6,362; clover 2,281; mixed grain 1,763.

R. O. P. 135—Splitear; Gr. Guernsey; 9 yrs.; fresh Sept. 11, 1916 and Jan. 20, 1918; record from April 1, 1917 to April 1, 1918.

Production: Milk 7,452 lbs., fat 377 lbs., test 5.0 per cent.

Feed (lbs.): Pasture 153 (days); silage 6,908; clover 2,321; mixed grain 2,013.

R. O. P. 136—Annie: Gr. Guernsey; 5 yrs.; fresh June 11, 1916 and April 25, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 8,738 lbs., fat 367.3 lbs., test 4.2 per cent.

Feed (lbs.): Pasture 153 (days); silage 7,450; clover 2,321; mixed grain 1,609.

Hass, Edward, New Holstein.

R. O. P. 137—Millie: Gr. Guernsey; 9 yrs.; fresh Jan. 27, 1917 and Jan. 28, 1918; record from April 1, 1917 to April 1, 1918.

Production: Milk 7,259 lbs., fat 382.8 lbs., test 5.3 per cent.

Feed (lbs.): Pasture 168 (days); silage 6,515; clover 315; alfalfa 1,664; mixed grain 815.

R. O. P. 138—Jennie 1st: Gr. Guernsey; 4 yrs.; fresh Nov. 22, 1916 and Dec. 11, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 7,685 lbs., fat 371.5 lbs., test 4.8 per cent.

Feed (lbs.): Pasture 168 (days); silage 6,515; clover 315; alfalfa 1,635; mixed grain 815.

R. O. P. 139—Jennie 2nd: Gr. Guernsey; 9 yrs.; fresh May 28, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 7,980 lbs., fat 419.2 lbs., test 5.3 per cent.

Feed (lbs.): Pasture 153 (days); silage 7,570; clover 2,321; mixed grain 1,795.

Kuhn, John, Elkhart Lake.

R. O. P. 140—Jack: Gr. Holstein; 4 yrs.; fresh Mar. 29, 1916 and April 15, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 9,658 lbs., fat 394.4 lbs., test 4.1 per cent.

Feed (lbs.): Pasture 168 (days); silage 2,402; mixed hay 1,816; mixed grain 786.

R. O. P. 141—Daisy 2nd: Gr. Holstein; 5 yrs.; fresh Dec. 31, 1916 and Dec. 17, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 11,225 lbs., fat 396.4 lbs., test 3.5 per cent.

Feed (lbs.): Pasture 168 (days); silage 2,402; mixed hay 1,816; mixed grain 1,273.

R. O. P. 142—Blessie, 4th: Gr. Holstein; 8 yrs.; fresh Dec. 23, 1916 and Dec. 15, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 10,179 lbs., fat 397.2 lbs., test 3.9 per cent.

Feed (lbs.): Pasture 168 (days); silage 2,402; mixed hay 1,816; mixed grain 1,321.

Libke, Hugo, New Holstein.

R. O. P. 62—Pride: Gr. Holstein; 3 yrs.; fresh Nov. 23, 1916 and Dec. 11, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 12,099 lbs., fat 451.9 lbs., test 3.7 per cent.

Feed (lbs.): Pasture 164 (days); silage 7,812; timothy 1,712; alfalfa 372; mixed grain 1,435.

R. O. P. 63—Ann: Gr. Holstein; 7 yrs.; fresh Nov. 19, 1916 and Dec. 17, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 13,085 lbs., fat 451.9 lbs., test 3.4 per cent.

Feed (lbs.): Pasture 164 (days); silage 7,812; timothy 1,712; alfalfa 372; mixed grain 1,497.

R. O. P. 64—Bessie: Gr. Holstein; 2 yrs.; fresh Nov. 9, 1916 and Nov. 12, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 10,157.2 lbs., fat 407.4 lbs., test 4.0 per cent.

Feed (lbs.): Pasture 164 (days); silage 7,812; alfalfa 372; timothy 1,712; mixed grain 1,454.

R. O. P. 65—Carrie: Gr. Holstein; 5 yrs.; fresh Nov. 4, 1916 and Oct. 25, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 11,821.2 lbs., fat 511.0 lbs., test 4.3 per cent.

Feed (lbs.): Pasture 164 (days); silage 7,812; alfalfa 372; timothy 1,712; mixed grain 1,938.

R. O. P. 66—Nellie: Gr. Holstein; 6 yrs.; fresh Mar. 14, 1916 and Mar. 24, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 11,022 lbs., fat 435.1 lbs., test 3.9 per cent.

Feed (lbs.): Pasture 164 (days); silage 7,812; alfalfa 372; timothy 1,712; mixed grain 1,048.

R. O. P. 67—Nancy: Gr. Holstein; 3 yrs.; fresh Feb. 25, 1917 and Jan. 23, 1918; record from April 1, 1917 to April 1, 1918.

Production: Milk 11,355 lbs., fat 375.6 lbs., test 3.3 per cent.

Feed (lbs.): Pasture 164 (days); silage 7,812; alfalfa 372; timothy 1,712; mixed grain 1,251.

R. O. P. 68—Martha: Gr. Holstein; 6 yrs.; fresh Mar. 2, 1917 and Mar. 21, 1918; record from April 1, 1917 to April 1, 1918.

Production: Milk 10,583 lbs., fat 388.9 lbs., test 3.6 per cent.

Feed (lbs.): Pasture 164 (days); silage 7,812; alfalfa 372; timothy 1,712; mixed grain 958.

Mattes, George, Kiel.

R. O. P. 70—McGinty: Gr. Guernsey; 6 yrs.; fresh Nov. 5, 1916 and Dec. 26, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 9,615 lbs., fat 403 lbs., test 4.1 per cent.

Feed (lbs.): Pasture 159 (days); silage 6,157; alfalfa 258; clover 1,098; mixed grain 1,354.

Meiselwitz, A. F., Elkhart Lake.

R. O. P. 69—Daisy: Native; 10 yrs.; fresh Jan. 13, 1917 and Dec. 22, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 8,966 lbs., fat 374.2 lbs., test 4.17 per cent.

Feed (lbs.): Pasture 172 (days); silage 5,876; corn fodder 2,100; timothy 664; mixed grain 1,045.

Thielke and Son, F. F., Kiel.

R. O. P. 73—Mary: Gr. Guernsey; 13 yrs.; fresh Jan. 6, 1917 and Jan. 19, 1918; record from April 1, 1917 to April 1, 1918.

Production: Milk 9,026 lbs., fat 441.7 lbs., test 4.8 per cent.

Feed (lbs.): Pasture 153 (days); silage 8,228; alfalfa 1,476; clover 395; mixed grain 1,443.

R. O. P. 74—Schleswig Maid, 24,774: Reg. Guernsey; 9 yrs.; fresh Nov. 19, 1916 and Nov. 10, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 8,035 lbs., fat 384.1 lbs., test 4.7 per cent.

Feed (lbs.): Pasture 153 (days); silage 8,228; alfalfa 1,569; clover 395; mixed grain 2,533.

R. O. P. 75—Schleswig Gypsy, 24,773: Reg. Guernsey; 9 yrs.; fresh Mar. 10, 1917 and Feb. 8, 1918; record from April 1, 1917 to April 1, 1918.

Production: Milk 8,101 lbs., fat 421.5 lbs., test 5.2 per cent.

Feed (lbs.): Pasture 153 (days); silage 8,228; alfalfa 1,476; mixed grain 1,527.

R. O. P. 76—Lily of Louis Corners, 34,436: Reg. Guernsey; 6 yrs.; fresh Nov. 10, 1916 and Nov. 24, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 8,710 lbs., fat 422.9 lbs., test 4.8 per cent.

Feed (lbs.): Pasture 153 (days); silage 8,228; alfalfa 1,569; clover 395; mixed grain 2,143.

R. O. P. 77—Primrose of Schleswig 2nd, 26,500: Reg. Guernsey; 8 yrs.; fresh Nov. 24, 1916 and Nov. 2, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 9,224.7 lbs., fat 567.9 lbs., test 6.1 per cent.

Feed (lbs.): Pasture 153 (days); silage 8,228; alfalfa 1,569; clover 395; mixed grain 2,710.

R. O. P. 78—Dairymaid of Louis Corners, 45,320: Reg. Guernsey; 4 yrs.; fresh Nov. 27, 1916 and Oct. 28, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 7,581.6 lbs., fat 410.3 lbs., test 5.4 per cent.

Feed (lbs.): Pasture 153 (days); silage 8,228; alfalfa 1,569; clover 395; mixed grain 2,438.

R. O. P. 79—Young Bless: Gr. Guernsey; 4 yrs.; fresh Nov. 5, 1916 and Nov. 12, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 8,096 lbs., fat 434.6 lbs., test 5.3 per cent.

Feed (lbs.): Pasture 153 (days); silage 8,228; alfalfa 1,569; clover 395; mixed grain 2,615.

R. O. P. 390—Alice of Louis Corners, 64,828: Reg. Guernsey; 2 yrs.; fresh Jan. 5, 1918 and Feb. 3, 1919; record from April 1, 1918 to April 1, 1919.

Production: Milk 9,138 lbs., fat 5.22 lbs., test 5.7 per cent.

Feed (lbs.): Pasture 161 (days); silage 10,779; alfalfa 689; timothy 718; mixed grain 1,907; rutabagas 586.

R. O. P. 391—Lady of Schleswig, 22,398: Reg. Guernsey; 11 yrs.; fresh Feb. 3, 1918 and Nov. 7, 1916; record from April 1, 1918 to April 1, 1919.

Production: Milk 8,863 lbs., fat 393.3 lbs., test 4.4 per cent.

Feed (lbs.): Pasture 161 (days); silage 10,779; alfalfa 689; timothy 900; mixed grain 2,813; rutabagas 1,738.

R. O. P. 392—Schleswig Maid, 24,774: Reg. Guernsey; 10 yrs.; fresh Nov. 10, 1917 and Oct. 19, 1918; record from April 1, 1918 to April 1, 1919.

Production: Milk 8,672 lbs., fat 437.9 lbs., test 5.05 per cent.

Feed (lbs.): Pasture 161 (days); silage 10,779; alfalfa 689; timothy 900; mixed grain 2,490; rutabagas 1,738.

R. O. P. 393—Dairymaid of Louis Corners, 45,320: Reg. Guernsey; 5 yrs.; fresh Oct. 28, 1917 and Oct. 23, 1918; record from April 1, 1918 to April 1, 1919.

Production: Milk 8,275 lbs., fat 378.8 lbs., test 4.57 per cent.

Feed (lbs.): Pasture 161 (days); silage 10,779; alfalfa 689; timothy 698; mixed grain 2,334; rutabagas 1,738.

R. O. P. 394—Primrose of Schleswig 2nd, 26,500: Reg. Guernsey; 9 yrs.; fresh Nov. 24, 1916 and Nov. 2, 1917; record from April 1, 1918 to April 1, 1919.

Production: Milk 8,855 lbs., fat 583.5 lbs., test 6.6 per cent.

Feed (lbs.): Pasture 161 (days); silage 10,779; alfalfa 689; timothy 900; mixed grain 3,128; rutabagas 1,738.

R. O. P. 402—Beauty of Louis Corners, 45,323: Reg. Guernsey; 5 yrs.; fresh Feb. 13, 1918 and Jan. 13, 1919; record from April 1, 1918 to April 1, 1919.

Production: Milk 9,713 lbs., fat 474.9 lbs., test 4.9 per cent.

Feed (lbs.): Pasture 161 (days); silage 10,779; alfalfa 689; timothy 780; mixed grain 2,053; rutabagas 6,461.

R. O. P. 403—Brindle: Gr. Guernsey; 10 yrs.; fresh Nov. 30, 1916 and May 18, 1918; record from April 1, 1918 to April 1, 1919.

Production: Milk 8,341 lbs., fat 448.9 lbs., test 5.4 per cent.

Feed (lbs.): Pasture 161 (days); silage 10,779; alfalfa 459; timothy 600; mixed grain 1,051.

R. O. P. 404—Meta: Gr. Guernsey; 10 yrs.; fresh April 5, 1918 and Mar. 11, 1919; record from April 1, 1918 to April 1, 1919.

Production: Milk 10,177 lbs., fat 424.7 lbs., test 4.17 per cent.

Feed (lbs.): Pasture 161 (days); silage 10,779; alfalfa 689; timothy 662; mixed grain 1,772.

Voigt, Armie, Kiel.

R. O. P. 395—Florie: Gr. Guernsey; 4 yrs.; fresh Jan. 15, 1918 and Jan. 18, 1919; record from April 1, 1918 to April 1, 1919.

Production: Milk 8,814 lbs., fat 378.1 lbs., test 4.29 per cent.

Feed (lbs.): Pasture 160 (days); silage 12,450; alfalfa 306; clover 330; mixed grain 1,811.

R. O. P. 396—Daisy of Cleveland, 58,621: Reg. Guernsey; 3 yrs.; fresh Nov. 6, 1917 and Nov. 1, 1918; record from April 1, 1918 to April 1, 1919.

Production: Milk 7,960 lbs., fat 382.8 lbs., test 4.8 per cent.

Feed (lbs.): Pasture 162 (days); silage 12,400; alfalfa 306; clover 606; mixed grain 2,297; rutabagas.

R. O. P. 397—Queen: Gr. Guernsey; 5 yrs.; fresh Nov. 8, 1917 and Nov. 24, 1918; record from April 1, 1918 to April 1, 1919.

Production: Milk 7,755 lbs., fat 384.5 lbs., test 4.96 per cent.

Feed (lbs.): Pasture 162 (days); silage 12,400; alfalfa 306; clover 516; mixed grain 2,132; rutabagas 155.

R. O. P. 398—Nigger: Native; 3 yrs.; fresh Mar. 10, 1918 and Jan. 29, 1919; record from April 1, 1918 to April 1, 1919.

Production: Milk 8,113 lbs., fat 370.3 lbs., test 4.56 per cent.

Feed (lbs.): Pasture 162 (days); silage 12,400; alfalfa 306; clover 330; mixed grain 1,743.

R. O. P. 399—Dolly of Louis Corners, 30,758: Reg. Guernsey; 8 yrs.; fresh Mar. 15, 1918 and April 1, 1919; record from April 1, 1918 to April 1, 1919.

Production: Milk 7,453 lbs., fat 370.9 lbs., test 4.98 per cent.

Feed (lbs.): Pasture 162 (days); silage 12,400; alfalfa 306; clover 153; mixed grain 1,473.

R. O. P. 400—Beauty:—Gr. Guernsey; 3 yrs.; fresh Jan. 11, 1918 and Dec. 2, 1918; record from April 1, 1918 to April 1, 1919.

Production: Milk 7,756 lbs., fat 412.8 lbs., test 5.32 per cent.

Feed (lbs.): Pasture 162 (days); silage 12,400; alfalfa 306; clover 516; mixed grain 2,042; rutabagas 155.

R. O. P. 401—Bessie of Cleveland, 45,246: Reg. Guernsey; 5 yrs.; fresh Jan. 13, 1918 and Dec. 12, 1918; record from April 1, 1918 to April 1, 1919.

Production: Milk 9,665 lbs., fat 407.8 lbs., test 4.22 per cent.

Feed (lbs.): Pasture 162 (days); silage 12,400; alfalfa 306; clover 516; mixed grain 2,064; rutabagas 155.

Voland, F. H., Kiel.

R. O. P. 71—Bloomie: Gr. Holstein; 10 yrs.; fresh Mar. 13, 1917 and Jan. 19, 1918; record from April 1, 1917 to April 1, 1918.

Production: Milk 11,119 lbs., fat 367.2 lbs., test 3.2 per cent.

Feed (lbs.): Pasture 193 (days); silage 5,539; alfalfa 548; clover 642; mixed grain 863.

Vorpahl, Erich, New Holstein.

R. O. P. 42—Jennie: Native; 5 yrs.; fresh Jan. 18, 1917 and Dec. 30, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 8,703 lbs., fat 394.4 lbs., test 4.5 per cent.

Feed (lbs.): Pasture 153 (days); silage 8,500; alfalfa 600; clover 1,897; mixed grain 1,561.

R. O. P. 43—Bockhouse: Gr. Guernsey; 11 yrs.; fresh April 16, 1917 and Mar. 8, 1918; record from April 1, 1917 to April 1, 1918.

Production: Milk 8,958 lbs., fat 391.2 lbs., test 4.3 per cent.

Feed (lbs.): Pasture 153 (days); silage 8,860; alfalfa 600; clover 1,897; mixed grain 1,305.

Weber, Gustav, New Holstein.

R. O. P. 143—Daisy: Gr. Holstein; 10 yrs.; fresh Oct. 11, 1915 and Dec. 21, 1916; record from April 1, 1917 to April 1, 1918.

Production: Milk 12,674 lbs., fat 404.8 lbs., test 3.2 per cent.

Feed (lbs.): Pasture 168 (days); silage 6,717; mixed hay 2,209; mixed grain 1,086.

R. O. P. 144—Pearl: Gr. Holstein; 5 yrs.; fresh Dec. 13, 1916 and Nov. 9, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 12,174 lbs., fat 376.1 lbs., test 3.0 per cent.

Feed (lbs.): Pasture 168 (days); silage 6,717; mixed hay 2,209; mixed grain 1,565.

R. O. P. 145—Fan: Gr. Holstein; 3 yrs.; fresh Oct. 20, 1916 and Nov. 10, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 10,783 lbs., fat 393.3 lbs., test 3.6 per cent.

Feed (lbs.): Pasture 168 (days); silage 6,717; mixed hay 2,209; mixed grain 1,603.

R. O. P. 146—Schimmel: Gr. Holstein; 9 yrs., fresh Feb. 16, 1917 and Jan. 14, 1918; record from April 1, 1917 to April 1, 1918.

Production: Milk 12,140 lbs., fat 399.6 lbs., test 3.3 per cent.

Feed (lbs.): Pasture 168 (days); silage 6,717; mixed hay 2,209; mixed grain 1,045.

R. O. P. 147—Mary: Gr. Holstein; 7 yrs.; fresh Nov. 12, 1916 and Oct. 23, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 11,923 lbs., fat 377.9 lbs., test 3.2 per cent.

Feed (lbs.): Pasture 168 (days); silage 6,717; mixed hay 2,299; mixed grain 1,693.

Wieting, A. W., New Holstein.

R. O. P. 148—Lena: Gr. Guernsey; 12 yrs.; fresh Oct. 21, 1916 and Nov. 8, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 8,814 lbs., fat 373.9 lbs., test 4.2 per cent.

Feed (lbs.): Pasture 153 (days); silage 5,735; clover 2,592; alfalfa 590; mixed grain 1,402.

R. O. P. 149—Bloomie: Gr. Holstein; 7 yrs.; fresh Mar. 23, 1917 and Mar. 12, 1918; record from April 1, 1917 to April 1, 1918.

Production: Milk 10,246 lbs., fat 394.2 lbs., test 3.8 per cent.

Feed (lbs.): Pasture 168 (days); silage 5,230; mixed hay 2,202; mixed grain 952.

OUTAGAMIE COUNTY NO. 1 ASSOCIATION

Sassmann, George I., Black Creek.

R. O. P. 210—Gerben Josephine Pietertje 4th, 258,174: Reg. Holstein; 3 yrs.; fresh Feb. 22, 1916 and Jan. 12, 1917; record from April 1, 1917 to April 1, 1918.

Production: Milk 11,722 lbs., fat 396.4 lbs., test 3.38 per cent.
Feed (lbs.): Pasture 153 (days); corn silage 8,440; mixed hay 2,130; oats 330; bran 330; gluten 3,180.
R. O. P. 211—Pauline Gerben Hengerveld, 206,906: Reg. Holstein; 4 yrs.; fresh April 2, 1916 and Mar. 10, 1917; record from April, 1917 to April, 1918.
Production: Milk 9,864 lbs., fat 378.3 lbs., test 3.83 per cent.
Feed (lbs.): Pasture 153 (days); corn silage 8,440; mixed hay 2,130; oats 330; bran 330; gluten 2,230.

PESHTIGO COLEMAN ASSOCIATION

Francour, Joseph, Route 2, Marinette.

R. O. P. 233—Dandy: Gr. Holstein; 4 yrs.; fresh Nov. 10, 1917; record from Dec. 1, 1917 to Oct. 1, 1918.

Production: Milk 11,029 lbs., fat 418.5 lbs., test 3.8 per cent.
Feed (lbs.): Pasture 143 (days); silage 4,750; hay 2,096; unicorn 900; Wisconsin balanced ration 490.

R. O. P. 234—Big Leslie: Gr. Holstein; 7 yrs.; fresh Nov. 29, 1918; record from Dec. 1, 1917 to Nov. 1, 1918.

Production: Milk 7,775 lbs., fat 369.0 lbs., test 4.64 per cent.
Feed (lbs.): Pasture 143 (days); silage 4,750; hay 2,096; unicorn 929; Wisconsin balanced ration 490.

Hart, Carl, Peshtigo.

R. O. P. 231—Midget: Native; 7 yrs.; fresh Feb. 1, 1918; record from Oct. 1, 1917 to Oct. 1, 1918.

Production: Milk 8,081 lbs., fat 409.5 lbs., test 5.06 per cent.
Feed (lbs.): Pasture 153 (days); silage 6,860; stover 1,680; hay 1,210; bran 776.

Kulberg, John, Peshtigo.

R. O. P. 242—No. 12: Gr. Guernsey; 5 yrs.; fresh Dec 1, 1917; record from Oct. 1, 1917 to Oct. 1, 1918.

Production: Milk 8,140 lbs., fat 377 lbs., test 4.63 per cent.
Feed (lbs.): Pasture 152 (days); silage 8,050; hay 1,350; grain 1,444; soybeans in straw 300.

Marinette County Asylum, Peshtigo.

R. O. P. 217—Johanna Pontiac Barbetta, 114,506: Reg. Holstein; 8 yrs.; fresh Feb. 11, 1918 and Feb. 18, 1917; record from Oct. 1, 1917 to Oct. 1, 1918.

Production: Milk 12,339 lbs., fat 422.7 lbs., test 3.66 per cent.
Feed (lbs.): Pasture 121 (days); silage 4,840; hay 2,746; grain mixture 2,506; stover 1,050; green corn 1,005.

R. O. P. 218—Johanna Segis Hengerveld, 182,271: Reg. Holstein; 5 yrs.; fresh Mar. 7, 1918 and Mar. 3, 1917; record from Oct. 1, 1917 to Oct. 1, 1918.

Production: Milk 10,257 lbs., fat 441.9 lbs., test 3.66 per cent.
Feed (lbs.): Pasture 122 (days); silage 5,280; hay 2,786; grain mixture 3,141; stover 2,055.

R. O. P. 219—Florence Segis Hengerveld, 178,294: Reg. Holstein; 5 yrs.; fresh Aug. 30, 1916 and Jan. 25, 1918; record from Oct. 1, 1917 to Oct. 1, 1918.

Production: Milk 10,481 lbs., fat 375.8 lbs., test 3.57 per cent.
Feed (lbs.): Pasture 122 (days); silage 4,910; hay 2,546; ground oats 180; stover 1,050; grain mixture 2,268; green corn 1,005.

R. O. P. 226—Wakatoma De Kol Burke 2d, 137,316: Reg. Holstein; 9 yrs.; fresh Jan. 31, 1918 and Jan. 29, 1917; record from Oct. 1, 1917 to Oct. 1, 1918.

Production: Milk 14,182 lbs., fat 635.6 lbs., test 3.24 per cent.
Feed (lbs.): Pasture 122 (days); silage 4,900; hay 2,546; grain mixture 2,922; stover 1,050; green corn 1,005.

Taylor, Duncan C., Peshtigo.

R. O. P. 216—"One Eyed" Lizzy: Gr. Jersey; 8 yrs.; fresh Dec. 20, 1917; record from Oct. 1, 1917 to Oct. 1, 1918.

Production: Milk 12,569 lbs., fat 569.7 lbs., test 4.53 per cent.
Feed (lbs.): Pasture 183 (days); silage 7,789; hay 1,600; mixed grain 1,713.

R. O. P. 237—Buckskin: Gr. Guernsey; 6 yrs.; fresh Mar. 16, 1918; record from Oct. 1, 1918 to Oct. 1, 1919.

Production: Milk 8,740 lbs., fat 386.2 lbs., test 4.3 per cent.
Feed (lbs.): Pasture 184 (days); silage 7,160; hay 3,086; mixed grain 660.

POLK COUNTY ASSOCIATION

Freeman, George L., Centuria.

R. O. P. 407—Lulu: Gr. Guernsey; 8 yrs.; fresh July 24, 1917 and Aug. 14, 1918; record from Aug. 1, 1918 to Aug. 1, 1919.

Production: Milk 7,834 lbs., fat 380.3 lbs., test 4.85 per cent.

Feed (lbs.): Pasture 184 (days); silage 5,211; hay 1,652; bran 306; oats 622.

Hawkinson, G. A., Route 2, Nye.

R. O. P. 405—Jessie: Gr. Guernsey; 4 yrs.; fresh May 20, 1918 and May 27, 1919; record from Aug. 1, 1918 to Aug. 1, 1919.

Production: Milk 8,157 lbs., fat 377.2 lbs., test 4.62 per cent.

Feed (lbs.): Pasture 173 (days); silage 9,528; roots 610; oats 846.

R. O. P. 406—Bessie: Gr. Guernsey; 4 yrs.; fresh May 10, 1918 and April 20, 1919; record from August 1, 1918 to August 1, 1919.

Production: Milk 7,194 lbs., fat 379.6 lbs., test 5.27 per cent.

Feed (lbs.): Pasture 173 (days); silage 9,528; roots 610; oats 846.

Nelson, Ernest, St. Croix Falls.

R. O. P. 408—Bobbie: Gr. Holstein; 7 yrs.; fresh Sept. 9, 1917 and Aug. 26, 1918; record from August 1, 1918 to Aug. 1, 1919.

Production: Milk 12,432 lbs., fat 473.6 lbs., test 3.8 per cent.

Feed (lbs.): Pasture 169 (days); silage 10,307 lbs., hay 1,885; bran 1,035; middlings 186; oats 833; barley 705; oilmeal 303.

R. O. P. 409—Katie: Gr. Holstein; 7 yrs.; fresh Sept. 9, 1917 and Nov. 8, 1918; record from Aug. 1, 1918 to Aug. 1, 1919.

Production: Milk 11,266 lbs., fat 412.0 lbs., test 3.66 per cent.

Feed (lbs.): Pasture 169 (days); silage 9,997; hay 1,885; bran 1,035; oats 705; barley 705; oilmeal 303.

REEDSBURG ASSOCIATION

Giese, John C., Route 1, Loganville.

R. O. P. 113—Lottie: Gr. Holstein; 9 yrs.; fresh Oct. 10, 1917 and Sept. 17, 1916; record from April 10, 1917 to April 10, 1918.

Production: Milk 10,851 lbs., fat 422.6 lbs., test 3.89 per cent.

Feed (lbs.): Pasture 161 (days); silage 5,790; hay 1,280; grain mixture 1,217; corn fodder 1,500.

R. O. P. 115—Daisy: Gr. Holstein; 8 yrs.; fresh Aug. 30, 1915 and Aug. 31, 1916; record from April 4, 1916 to April 4, 1917.

Production: Milk 8,957 lbs., fat 383.7 lbs., test 4.28 per cent.

Feed (lbs.): Pasture 183 (days); silage 7,474; clover 310; bran 386; oats 786; barley 1,510.

Kirkpatrick Bros., Reedsburg.

R. O. P. 49—Helena of Wayside, 133,321; Reg. Holstein; 7 yrs.; fresh Mar. 15, 1917; record from April 12, 1916 to April 12, 1917.

Production: Milk 13,942 lbs., fat 605.5 lbs., test 4.34 per cent.

Feed (lbs.): Pasture 183 (days); silage 6,530; hay 620; clover 851; mixture 359; ajax 634; alfalfa 510; oilmeal 97.

Kruse, Conrad G., Loganville.

R. O. P. 48—Prosperity Korndyke, 153,000; Reg. Holstein; 7 yrs.; fresh —; record from April 4, 1917 to April 4, 1918.

Production: Milk 11,139 lbs., fat 370.7 lbs., test 3.5 per cent.

Feed (lbs.): Pasture 153 (days); silage 9,348; oats 582; cottonseed meal 183; hay 393.

Wood, Edgar A., Loganville.

R. O. P. 114—Blossom: Gr. Holstein; 8 yrs.; fresh December, 1916 and February, 1918; record from April 16, 1917 to April 16, 1918.

Production: Milk 10,561 lbs., fat 387.0 lbs., test 3.66 per cent.

Feed (lbs.): Pasture 153 (days); silage 6,805; oilmeal 90; bran 1,141; oats 320; hay 905; unicorn 174; corn fodder 740; straw 740.

SHAWANO COUNTY NO. 1 ASSOCIATION

Dittman, Frank, Underhill.

R. O. P. 52—Dollie: Gr. Holstein; 6 yrs.; fresh Mar. 2, 1917 and Jan. 23, 1918; record from May 9, 1917 to May 9, 1918.

Production: Milk 9,928 lbs., fat 383.0 lbs., test 3.91 per cent.

Feed (lbs.): Pasture 153 (days); silage 8,240; clover hay 1,504; oilmeal 30; grain mixture 1,367.

Olson, Albert, Underhill.

R. O. P. 53—Daisy: Gr. Guernsey; 5 yrs.; fresh Sept. 17, 1916 and Jan. 12, 1918; record from May 19, 1916 to May 19, 1917.

Production: Milk 6,725 lbs., fat 368.2 lbs., test 5.47 per cent.

Feed (lbs.): Pasture 213 (days); silage 4,650; mixed hay 1,784; clover straw 434; oat straw 196; grain mixture 1,619.

Rousseau, G. R., Cecil.

R. O. P. 54—Sadie: Gr. Holstein; 6 yrs.; fresh Feb. 8, 1917 and Dec. 28, 1918; record from May 12, 1917 to May 12, 1918.

Production: Milk 8,667 lbs., fat 392.7 lbs. test 4.52 per cent.

Feed (lbs.): Pasture 183 (days); silage 5,015; oat hay 834; stover 1,800; oats 60; grain mixture 453; clover chaff 690; clover hay 515; barley feed 110.

SPRING GREEN ASSOCIATION

Lins, Henry, Spring Green.

R. O. P. 11—Sally: Gr. Holstein; 5 yrs.; fresh March 21, 1918; record from April 1, 1917 to April 1, 1918.

Production: Milk 11,350 lbs., fat 408.3 lbs., test 3.6 per cent.

Feed (lbs.): Pasture 214 (days); silage 4,300; hay 2,785; mixed grain 1,050.

Peck, Leon, Spring Green.

R. O. P. 12—Annie: Gr. Holstein; 7 yrs.; fresh April 10, 1917; record from April 10, 1917 to April 24, 1918.

Production: Milk 14,249 lbs., fat 505.6 lbs., test 3.53 per cent.

Feed (lbs.): Pasture 153 (days); silage 14,080; fodder 415; grain 4,456; mixed hay 295.

STRATFORD COOPERATIVE ASSOCIATION

Keller, Harry R., Stratford.

R. O. P. 116—Star: Gr. Holstein; 3 yrs.; fresh Feb. 15, 1917 and Feb. 21, 1918; record from Aug. 1, 1917 to Aug. 1, 1918.

Production: Milk 10,437 lbs., fat 367.4 lbs., test 3.52 per cent.

Feed (lbs.): Pasture 153 (days); silage 3,715; May 2,835; roots 365; grain 1,171.

R. O. P. 410—Star: Gr. Holstein; 4 yrs.; fresh Jan. 21, 1918 and Jan. 12, 1919; record from Aug. 1, 1918 to Aug. 1, 1919.

Production: Milk 10,274 lbs., fat 385.5 lbs., test 3.75 per cent.

Feed (lbs.): Pasture 184 (days); silage 6,325; clover hay 2,429; grain 1,649.

Schneider, William, Stratford.

R. O. P. 117—Susie: Gr. Holstein; 9 yrs.; fresh Mar. 3, 1917 and Feb. 13, 1918; record from Aug. 1, 1917 to Aug. 1, 1918.

Production: Milk 11,740 lbs., fat 397.9 lbs., test 3.4 per cent.

Feed (lbs.): Pasture 143 (days); silage 1,215; Wisconsin balanced ration 1,763; hay 2,889.

Spindler, Jacob, Route 1, Stratford.

R. O. P. 119—Nell: Native; 8 yrs.; fresh Dec. 4, 1914 and Nov. 20, 1915; record from Aug. 1, 1915 to August 1, 1916.

Production: Milk 9,362 lbs., fat 463.9 lbs., test 4.7 per cent.

Feed (lbs.): Pasture 194 (days); silage 1,800; hay 990; ground oats 1,080; corn meal 240; oilmeal 240.

WAUPACA AND BUTTERNUT RIDGE ASSOCIATION

Constance, F. R., and Sons, Waupaca.

R. O. P. 37—Grey: Gr. Jersey; 4 yrs.; fresh Dec. 7, 1916 and Oct. 25, 1917; record from April 1, 1916 to April 1, 1917.

Production: Milk 7,542 lbs., fat 404.5 lbs., test 5.36 per cent.

Feed (lbs.): Pasture 122 (days); silage 4,103; hay 3,122; hominy 2,075; oilmeal 121.

R. O. P. 38—Rosabelle's Eurybia, 337,493: Reg. Jersey; 2 yrs.; fresh Sept. 13, 1916 and Dec. 10, 1917; record from April 1, 1916 to April 1, 1917.

Production: Milk 7,590 lbs., fat 390.5 lbs., test 5.14 per cent.

Feed (lbs.): Pasture 153 (days); silage 4,103; hay 3,122; hominy 2,066; oilmeal 106.

WEST BEND ASSOCIATION

Meuschke, William, West Bend.

R. O. P. 412—Evergreen Pontiac Queen, 261,866: Reg. Holstein; 4 yrs.; fresh May 27, 1918 and May 20, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 12,656 lbs., fat 383.5 lbs., test 3.03 per cent.

Feed (lbs.): Pasture 183 (days); silage 8,775; hay 1,238; bran 271; oats 1,498; gluten 181; oilmeal 67; barley 193; beets 496.

Moths, Walter, Route 3, Fredonia.

R. O. P. 413—Number 3: Native; 9 yrs.; fresh Feb. 18, 1918 and Jan. 28, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 10,512 lbs., fat 373.3 lbs., test 3.55 per cent.

Feed (lbs.): Pasture 60 (days); silage 6,915; hay 1,660; bran 287; gluten 295; oats 355; barley 448.

Schulze, Ernst W., Route 7, West Bend.

R. O. P. 414—Number 2: Native; 8 yrs.; fresh Mar. 1, 1918 and Mar. 7, 1919; record from July 1, 1918 to July 1, 1919.

Production: Milk 9,431 lbs., fat 393.7 lbs., test 4.17 per cent.

Feed (lbs.): Pasture 153 (days); silage 7,420; hay 1,696; bran 400; barley 1,027; corn fodder 460; oats 238.

Stauske, William, Route 2, Fredonia

R. O. P. 411—Spottie: Gr. Guernsey; record from July 1, 1918 to July 1, 1919.

Production: Milk 7,664 lbs., fat 384.4 lbs., test 5.02 per cent.

Feed (lbs.): Pasture 183 (days); silage 2,994; hay 2,487; bran 481; middlings 111; gluten 170; germ meal 44; barley 59; oats 732.

WILTON ASSOCIATION

Brandau, William, Wilton

R. O. P. 418—No. 16: Gr. Guernsey; 5 yrs.; fresh Nov., 1917 and Nov. 1, 1918; record from May 1, 1918 to May 1, 1919.

Production: Milk 7,970 lbs., fat 378.6 lbs., test 4.75 per cent.

Feed (lbs.): Pasture 173 (days); silage 5,910; hay 2,100; grain 1,588.

Hubert, Herman, Tomah.

R. O. P. 419—Topsy: Gr. Jersey; 9 yrs.; fresh Mar. 4, 1918 and Jan. 17, 1919; record April 1, 1918 to April 1, 1919.

Production: Milk 7,984 lbs., fat 365 lbs., test 4.59 per cent.

Feed (lbs.): Pasture 199 (days); silage 5,746; hay 1,153; grain 1,616.

Thurrow, John, Wilton.

R. O. P. 415—Star: Gr. Guernsey; 4 yrs.; fresh June 1, 1917 and Nov. 1, 1918; record from April 7, 1918 to April 7, 1919.

Production: Milk 7,055 lbs., fat 373.7 lbs., test 5.3 per cent.

Feed (lbs.): Pasture 153 (days); silage 4,620; hay 2,153; grain 1,730.

Waage, F. A., Wilton.

R. O. P. 416—Sy: Gr. Guernsey; 4 yrs.; fresh August, 1916 and Dec. 15, 1918; record from April 10, 1918 to April 10, 1919.

Production: Milk 8,113 lbs., fat 388.9 lbs., test 4.79 per cent.

Feed (lbs.): Pasture 153 (days); silage 4,107; hay 1,813; grain 1,106.

R. O. P. 417—Polly: Gr. Guernsey; 4 yrs.; fresh July 1, 1917 and Sept. 5, 1918; record from April 10, 1918 to April 10, 1919.

Production: Milk 6,737 lbs., fat 367.5 lbs., test 5.45 per cent.

Feed (lbs.): Pasture 153 (days); silage 4,107; hay 1,813; grain 1,270.

R. O. P. 420—Doll: Gr. Guernsey; 4 yrs.; fresh Dec., 1917 and Feb., 1918; record from April 10, 1918 to April 10, 1919.

Production: Milk 8,059 lbs., fat 367.8 lbs., test 4.56 per cent.

Feed (lbs.): Pasture 164 (days); silage 4,107; hay 1,810; grain 889.

WINCHESTER DAIRY IMPROVEMENT ASSOCIATION

Christianson, Elmer M., Route 15, Larsen.

R. O. P. 195—No. 20: Gr. Holstein; 5 yrs.; fresh Feb. 21, 1917 and Mar. 14, 1918; record from April 11, 1917 to April 11, 1918.

Production: Milk 9,240 lbs., fat 368.3 lbs., test 3.98 per cent.

Feed (lbs.): Pasture 193 (days); silage 6,910; mixed hay 2,521; grain mixture 1,074.

R. O. P. 196—No. 10: Gr. Holstein; 7 yrs.; fresh Dec. 28, 1916 and Jan. 15, 1918; record from April 11, 1917 to April 11, 1918.

Production: Milk 8,906 lbs., fat 365.1 lbs., test 4.19 per cent.

Feed (lbs.): Pasture 193 (days); silage 6,910; mixed hay 2,521; grain mixture 1,299.

Kittleson, Roy C., Larsen.

R. O. P. 109—Lucy: Gr. Holstein; 11 yrs.; fresh Feb. 4, 1917 and Jan. 17, 1918; record from April 15, 1917 to April 15, 1918.

Production: Milk 8,077 lbs., fat 365.8 lbs., test 4.53 per cent.
Feed (lbs.): Pasture 193 (days); silage 6,800; mixed hay 2,010; grain mixture 1,432.

R. O. P. 110—Skylark: Gr. Durham; 5 yrs.; fresh Jan. 22, 1917 and Nov. 28, 1917; record from April 15, 1917 to April 15, 1918.

Production: Milk 8,698 lbs., fat 398.3 lbs., test 4.58 per cent.
Feed (lbs.): Pasture 193 (days); corn silage 7,493; mixed hay 2,010; mixed grain 1,929.

Raehl, Helmet, Larsen.

R. O. P. 127—No. 20: Gr. Holstein; 7 yrs.; fresh April 15, 1916 and Feb. 10, 1918; record from May 20, 1917 to May 29, 1918.

Production: Milk 9,398 lbs., fat 371.2 lbs., test 3.95 per cent.
Feed (lbs.): Pasture 214 (days); corn silage 9,315; mixed hay 2,606; grain mixture 1,662.

R. O. P. 126—No. 13: Gr. Holstein; 8 yrs.; fresh April 1, 1917 and Mar. 7, 1918; record from May 20, 1917 to May 20, 1918.

Production: Milk 10,825 lbs., fat 383.6 lbs., test 3.5 per cent.
Feed (lbs.): Pasture 183 (days); corn silage 10,635; mixed hay 2,606; grain mixture 1,338.

WOLF RIVER ASSOCIATION

Harmann, Henry, Algoma.

R. O. P. 101—Jennie: Gr. Guernsey; 8 yrs.; fresh Jan. 5, 1917 and Jan. 11, 1918; record from April 4, 1917 to March 25, 1918.

Production: Milk 9,179.6 lbs., fat 435.3 lbs., test 4.7 per cent.
Feed (lbs.): Pasture 168 (days); silage 4,254; hay 2,553; mixed grain 2,593; straw 785; mangels 310.

R. O. P. 102—Lily: Gr. Guernsey; 9 yrs.; fresh Dec. 5, 1916 and Dec. 11, 1917; record from April 4, 1917 to April 4, 1918.

Production: Milk 10,044 lbs., fat 427.3 lbs., test 4.2 per cent.
Feed (lbs.): Pasture 168 (days); silage 3,434; hay 2,761; grain mixture 2,671; straw 650; mangels 1,036.

R. O. P. 103—Pet: Gr. Guernsey; 8 yrs.; fresh Oct. 16, 1916 and Oct. 19, 1917; record from April 4, 1917 to April 4, 1918.

Production: Milk 10,358 lbs., fat 436.6 lbs., test 4.2 per cent.
Feed (lbs.): Pasture 168 (days); silage 3,934; hay 2,510; grain mixture 3,015; straw 720; mangels 1,402.

R. O. P. 104—Mary: Gr. Holstein; 8 yrs.; fresh Mar. 15, 1917 and Mar. 1, 1918; record from April 4, 1917 to April 4, 1918.

Production: Milk 9,904 lbs., fat 438.5 lbs., test 5.1 per cent.
Feed (lbs.): Pasture 168 (days); silage 4,033; hay 2,328; grain mixture 2,806; beet pulp 550.

R. O. P. 192—Goldie: Gr. Guernsey; 7 yrs.; fresh Dec. 1, 1916 and Dec. 6, 1917; record from April 4, 1917 to April 4, 1918.

Production: Milk 7,575 lbs., fat 399.3 lbs., test 5.3 per cent.
Feed (lbs.): Pasture 168 (days); silage 3,795; hay 2,285; grain mixture 2,247; straw 720; mangels 310.

Sibilsky, Otto, Algoma.

R. O. P. 193—Rosie: Gr. Jersey; 10 yrs.; fresh Nov. 25, 1916 and Nov. 30, 1917; record from April 25, 1917 to April 25, 1918.

Production: Milk 8,401 lbs., fat 384.7 lbs., test 4.6 per cent.
Feed (lbs.): Pasture 127 (days); silage 6,760; hay 620; green hay 374; dry hay and straw 4,342; grain mixture 2,399.

R. O. P. 197—Bossie: Gr. Holstein; 9 yrs.; fresh Nov. 29, 1916 and Dec. 1, 1917; record from April 25, 1917 to April 25, 1918.

Production: Milk 11,994 lbs., fat 433.6 lbs., test 3.6 per cent.
Feed (lbs.): Pasture 127 (days); corn silage 7,435; hay 1,676; oat straw 1,940; grain mixture 2,920; pea straw 2,322.





NG NAME ^{AN} AN ATTRACTIVE ENTRANCE ADD PERMANENCE TO THE FARM HOME

WHAT NAME FOR THE FARM

EXTENSION SERVICE - COLLEGE OF AGRICULTURE
THE UNIVERSITY OF WISCONSIN

MADISON

As a country, even the middle west is still in the raw. Our roots are not yet deep enough into the soil so that a family home is anchored there as a relatively permanent feature of the countryside. The pioneer builds as best he may; his son must needs replace the primitive shack with a better home; but we have not yet fully acquired that love for the old roof tree which is the pride of the Old and the New England, and the South.

A properly chosen farm house name will go far in developing that sense of pride which is a fundamental basis for a more enduring and permanent country living.

H. L. Russell
Director

What Name for the Farm?

FRANZ A. AUST AND GLADYS BAKER

A good name helps to make a good farm. It dignifies the farm home and increases the value of the farm property. It adds permanency to agriculture and shows pride in the business of farming. It marks the farm home and the farmer's place of business. A good farm name can be sold with the land as the good will of a firm can be sold with the business. Certain localities have become famous because of their good farms and the distinctive names that go with them. A good name is one of the first essentials in building up a good reputation and a tradition for the farm. In the mind of the farmer the question is not so much whether to name the farm, but what name for the farm.

THE FARM A HOME AND A PLACE OF BUSINESS

First of all, the farm owner wants a name that will be useful. Every real farmer considers that the farm is both his home and his place of business. For this reason the name must be useful in two ways—it should take the place of a number on the city house, that is, identify the home; and it should perform the same service as the bronze name on a business institution, which locates the place of business. The farm name, no matter where it is displayed, should be as pleasing to the man who goes to see the farmer on business as to the woman who comes to call on the farmer's wife. Idlewild is not impressive as the name of a business; the Utility Poultry Farm has little appeal as the name for a home.

The two uses of the farm name may be filled by the same words, if they are carefully chosen. The name for a home should be dignified, permanent, suitable, and pleasing in sound and suggestion. It should not be too common a name nor one hard to remember. The business use of the name demands the same characteristics and, in addition, it should be brief, easily

pronounced, and easy to read. More than three words make too long a name for good advertising, and the two-word length is usually best. Compare, for example, Maple Grove Dairy and Stock Farm with Thorn Hill, or Summit Farm.

USING THE FARM NAME IN BUSINESS

The name is used to identify the farm. To mark effectively the place of business the name must be attractive and distinctive to the passer-by, the mailman, or the business caller. Mail will be addressed with the name of the farm. The business caller will use it to locate the farm. Hence, the name should be displayed near the entrance.

Besides using the name for identification the farmer uses it for advertising. The most practical method is on stationery, for good farm letters demand a business address and a good letterhead. The return address on the envelopes should also carry the name. Distinctiveness, individuality, and legibility are qualities especially important on the letterhead.

The cost of the letterhead is small compared with other kinds of advertising, but whether worked out by the home printer, or the engraver of stationery, simplicity and quality should be the rule. Some names otherwise suitable may not look well on the letterhead; this point should be kept in mind.

USING THE NAME ON FARM PRODUCE

To make the very best use of the farm name it should also be associated with the farm produce. It may even be copyrighted and used as a trademark. A name used in connection with fruit, dairy products, or livestock is a real asset. Both the producer and the consumer become accustomed to it and use it as a mark of quality.

If vegetables, maple sugar, eggs, or grain are shipped, the containers are more attractive if the name of the farm is used. It is not alone the attractiveness that sells the goods, either, but the feeling of confidence that the producer's signature gives to the buyer. He feels that the farmer, through the trademark, is back of the product. On the other hand, the farmer may want to advertise his product in the newspapers, in which case a farm name is invaluable.

The right kind of name carries with it some attractive distinction in favor of the produce sold. Cold Springs Dairy, Redcliff Poultry, Applewood, Hillandale, are names that readily make friends for a quality commodity produced on the farms.

USING THE NAME FOR LIVESTOCK

Livestock is a kind of farm produce which very often carries the farm name. This is one of the best means of farm advertising. Brevity is very essential, because the name of an animal must not be too unwieldy. A musical name, easy to say, one that goes "trippingly on the tongue," is especially necessary if the farm name is to be repeated in the names of livestock. Anoka, Tuscola, and Waucedah are appropriate Indian words which breeders of purebred livestock find useful for both farm and produce. Stony Brook, Longlands, Green Acres, and Westwood suggest the possibilities of English words.

The manufactured name, compounded of proper names of some members of the family, may sometimes fit the purpose. For example, Raywood Farm is a combination of the name of the owner with the family name of his wife. It is short, musical, not too personal, excellent to use as a distinguishing name for the stock. Great care must be used in making such a name, however, so that it will be pleasing to both the eye and ear.

DISPLAYING THE NAME ON THE FARMSTEAD

The two uses of the farm name make it difficult to display it properly. As a place of business the display of the name should give it the best advertising possible. It should be bold and demand the attention. As a name for the farm home the display should be fitting and in keeping with all that is best in home life. It should make the home seem more homelike by adding a touch of distinction, privacy, and reserve. These two purposes often make it difficult to decide upon the proper means of display. Obviously, the place of display is somewhere upon the farm home grounds, for this is the place of business and the home, as well, but the line between what is good advertising and what is fitting for an attractive home is not always easy to find. The display of the farm name becomes, therefore, a compromise between sufficient advertising and the "home first" idea.

Using the barns and sheds to carry the name is a practice which is common everywhere, but there are a good many objections to it. The barn is necessarily larger and more important in the landscape than the other farm buildings, but the home should be the most important feature of the entire farmstead. Placing the name on the barn draws the attention to the barn and lessens the importance of the home.

The location of the barn with reference to the house helps to solve the problem. If the house stands nearer the road than the barn does, the name may well be displayed on the barn and not be objectionable. Again, when the barn is so situated and national advertising is essential, it may be desirable to display the name conspicuously but in such instances the farm home loses its rightful prominence.

Lack of space in the city makes the sign on the building a fitting thing, but with all outdoors to use as a place for the name on the farm, there hardly seems a good reason for using a building.

The farmer who finds it puzzling to draw the line between privacy for the farm home and advertising the farm business may take his cue from the farm where the name is displayed upon a neatly supported mail-box with a swinging sign above it or a well-designed signboard.

In localities where boulders are plentiful, a big granite boulder bearing the farm name may be placed near the farm entrance. Either the name can be cut in the stone, or a bronze plate carefully designed and attached to the stone may be used.

Entrance gates form a good background for displaying the name. They may be made very attractive and the stone, brick, or cement pillars of the gate may serve as anchor posts for the fence and as a transition from the regular wire fence to a simple yard fence, when such is used. In all cases, the design should be simple, yet dignified, and the farm name should be easily read from the highway.

EXPENSE OF DISPLAY CONVENIENTLY VARIED

The cost of displaying the name is always an important item, but fear of expense need not stand in the way of an attractive and neat design. The most costly way is not always the best way. The elaborateness of the design should be gauged according to the character of the farm, the entrance, and the farm-

house. A well-lettered signboard supported above a mailbox need not cost more than \$6 or \$7 if done in gold leaf, and \$5 if only painted. The same board bearing the farm name can be displayed somewhat differently at an additional cost of \$5.

Having the name painted on the barn will usually cost more. A sign bearing the name of the farm and the name of the owner, if painted in small letters, can be furnished by a good sign painter for \$15 but very large lettering would cost \$40 to \$45. Most persons would prefer the smaller lettering. Raised lettering may also be used, but this is a little more expensive.

An attractive gateway adds so much to the appearance of the farm that many farmers like to combine the display of the farm name with the entrance, although the combined cost is greater than for either one alone. A practical, simple gateway may be extremely pleasing without being expensive. Made of two pillars of field stone with a crosspiece of concrete at the top such a gateway would cost, if built by a contractor, \$150 to \$200. The name of the farm should be cut in the crosspiece. The beam alone if 10 inches by 14 inches by 16 feet, constructed of concrete, would cost \$35 to \$40. Made from white oak timber of the same size, the beam would cost \$50 to \$60. Where the gateway is part of the fence, anchor posts (such as those shown in the cover picture) may be added. The name may then be placed on the stone wall and the cross beam may be omitted. The average farmer working at odd times could build such an entrance for less money. An entrance made from the wood and stone of the farm and by the labor of the owner would be truly appropriate. The oak beam could be cut from the farm woodlot at a cost of two days' labor; the stone could be picked up on the farm and the cost of the stone work materially reduced, since labor is the largest item of expense.

The cost of having the name cut on a boulder will vary from \$5 to \$10, depending on the length of the name. This type of treatment can be made to stand out more clearly by using gilt letters in the chiseled name. This would cost from \$3 to \$5 additional. A bronze plate bearing the farm name will cost from \$30 to \$50.

An expense that more than pays for itself in neatness, advertising value, and personal satisfaction is that of good lettering. A draughtsman, architect, sign painter, or monument

stone cutter will, for a small charge, letter a design for the farm name which will avoid the poorly formed letters and bad design often seen on less carefully made signs. This item of expense will probably never exceed \$10, and \$3 will often cover it.

A caution that it is well for the farmer to keep in mind is, make the sign readable. Letters that show a good deal of decoration are hard to read. An entire name in capital letters is harder to read than a name in capital and small letters. Certain colors of paint are likely to blur in reading and some colors are not pleasing when used on a large sign.

FARM NAMES MAY BE REGISTERED

In Wisconsin a state law provides that farm names may be registered with the county register of deeds for a fee of 25 cents, providing that the name has not already been so registered within the county. This protects each farmer against the register of the same name in his own county but there is no way of preventing duplication of the name. Any other farm can use the same name, although it cannot be registered a second time in the same county. For use on farm produce a name may be trademarked, but this would not prevent another farmer from adopting the same name for his farm, although he could not use it on his produce. The best way to make sure that the name will not be duplicated, however, is to select a name so individual that it belongs particularly to the farm.

FARM NAMES SHOULD BE DIGNIFIED AND PERMANENT

In choosing among the many names that seem to be possibilities for the farm, the first consideration is whether the name is suited to the place where a family lives. The right farm name will outlast the man who gives it. It will be passed on to the next generation. Such a name must have not only individuality and dignity, but it must also carry with it pride of ownership, pride in agriculture, and pride in rural life. It must have something in it to live up to.

In the blue grass country where farms have remained in the same family for generations and where the traditions of good farming are strong, there are names which have belonged to the land for generations. Within one Virginia community are such names as Bollingbrook, Foxcroft, Oakum, Huntland.

Laurelhill, Burrland, White Hall, and Delta Farm. The farms on the Lexington and Georgetown turnpikes in Kentucky show much the same individuality in names. All of them are a part of the history of the countryside: Woodburn, Ashand, Walnut Hall, Auvergne, Buck Run Farm, Hempstead, Elmspring, Kirklevington, Shenandoah Hall, Elmendorf. Pride in the land prompts the name for the farm, and the name of the family place helps to perpetuate that pride.

Every farmer can find an individual and dignified name for his farm. No farm dweller wants to choose a name from Virginia or Kentucky, famous though they are, nor any name which a hundred other farms may have. Neither does any one want a name that can be laughed at, because it is too fancy, not dignified, or not suitable to the farm. Hunky-Dory and Lickety-split are no more ridiculous than Catalpa Manor and Million-Dollar Farm. The play on words, as in Justamere Farm and Iona Farm, may be cleverly done, but the name lacks dignity and beauty.

THE FAMILY NAME USED IN THE FARM NAME

American farmers generally have a prejudice against seeing their own names attached to the farm, not because they are not proud of their homes and business, but as a recognition of the fact that the land is bigger than the man. Big Cottonwood Farm is just as distinctive and considerably more modest than the A. M. Brown Stock Farm. The place named for the owner has the disadvantage of changing the name with the owner, while the farm named for the big tree may keep the name though owners change.

There are cases, however, where a family name having historical significance may be appropriately used in the farm name. When the land has long been owned by the same family or when the family has been long established in the community or in the history of the state, no vainglory can be charged against the owner who uses his family name for the farm. Many farms might be named after the rugged pioneers who made them. A New Hampshire farm which has been in the same family for seven generations may well be known as Sanford Place. Even so, some such surnames are lacking in the other qualities that make a good farm name. O'Grady, Smith, and Parker are fine old names, but attached to a farm they are not so attractive as Loveland or Fenimore.

Family names may often be merely suggested, as in Warwood, which is formed from the initials of the owner plus the word, *wood*. Tarpleywick is a Wisconsin farm name derived from the family name of an English mother and the word *wick*, meaning a dwelling or a place of work.

Names derived from the farm specialty may sometimes be appropriate, but, like family names, they may be too commonplace. A man may be proud of his farm without calling it the Cox Holstein Farm. The Black and White Farm and Chain O' Lakes Farm are both possibilities which Wisconsin breeders have adopted for their farms. To breeders of Guernseys, Sarnia is truly representative of their breed and much more distinctive than Elm Grove Guernsey Farm. Any farm may be well named; it is all a matter of care and thought.

AMERICAN NAMES FOR AMERICAN FARMS

Wisconsin farmers can learn much from the land-holders of Europe about naming farms, but that does not mean borrowing names from other countries. Great Britain, from whom many agricultural traditions and farming peoples in the state have come, has for many years named her estates. The foundation words used are common to our language and are often used in this country—copse, moor, croft, knoll, dale, wold. From these foundation words are made such combinations as Brier Copse, Beechcroft, Arrowmoor, Pleasant Knoll, Marydale, and Shady Wold. While these names are easily applicable to American farms, yet grove, bluff, coulee, creek, canyon, and prairie have the Yankee sound that suits the Yankee ear. Hickory Grove, Eagle Bluff, Deep Coulee, Swift Creek, One Mile Canyon, and Wolf Prairie are typical of American names for American farms.

The Celtic names of Ireland and Scotland, the Scandinavian words of Denmark, Norway, and Sweden, and the Polish, German, and Swiss place names, may be pleasant to the ears of Wisconsin farmers who hail from those lands, but Americanism prompts him to choose a name belonging to the country of his choice.

SUPPLY OF FARM NAMES FOR WISCONSIN UNLIMITED

Wisconsin is a state of so much natural beauty that most farms here are named for rivers, lakes, hills, trees and birds and

other animal life. White River, Moose Lake, Tall Cedar, Moccasin Hill, are suggestions of the wealth of names that lies at the very gate of every Wisconsin farmstead.

Natural beauty is not the only advantage Wisconsin farmers have. Indian tradition of the Lakes and the Mississippi; lead and copper mining; famous trails, highways, and portages, and early settlements—all these supply a fund of names. Scarcely a county in the state is far distant from some historical event worth perpetuating in the names of some of its farms. Best of all, information of this sort is easily obtained, either from some of the old settlers or from county or state historical societies. Names such as Marquette Springs, Indian Trail, Chaux Pierre, Tintonwan, Lost Mine, Black Hawk, and Old Town, are names that will cling to the farm and tell the story of the land for generations.

WHAT NAME FOR THE FARM?

With so many sources of farm names at hand, it is impossible to give a complete list for even one county. But from a list of "name beginnings" and "name endings," together with a list of Indian names, the family on the farm has the interesting prospect of building the name for their own farm. The State Historical Society (address the secretary, Madison) is prepared to give information on the history and legends of practically every county in the state, and from these facts suitable names may be found.

It is a good plan when naming the farm to keep in mind the outstanding features, the things that visitors observe, that the children remember when they are away from home, that make each member of the family call this farmstead his home rather than some other. Look over all the possibilities. Are there trees, birds, rocks, streams, or other natural features of which the family is especially fond, or which are remarked upon for beauty? No farm is without some of these, and combinations of different features are often possible, as in Sandyford, Knollwood, and Watersmeet. Is the land high, hilly, level, low, broken, or rolling prairie? Hilly Lands and Long Prairie may suggest other names. A gate, a view, a bridge, may suggest home to the family and the name may be Windygates, Eastgate, or Redgate, Far View, Overlook, or Hilltop, Stonebridge, Bridge Hill, or High Bridge. Is there a landmark of some sort

on the farm, or is there in the neighborhood any historical event or person worth remembering in the name of the farm? Council House, Big Cache, and Beacon Hill are names which may be made more local by a study of the history of the neighborhood.

Consider, also, the principal business of the farm. A name that will fit a fruit farm may not be equally appropriate to a stock farm. Bittersweet is not as forceful a name as The Boulders. Likewise, a name that fits one part of the country may not be as appropriate to another section. For example, outside of the Mississippi river counties of Wisconsin, Wolf Coulee as a farm name has no significance.

Imagine a farm in the Kickapoo Hills country which has an outstanding feature known as Monument Rock. The land is gently rolling, the house is built on a slight knoll, some pure-bred dairy cattle are kept, considerable clover is grown, a grove of oaks lies east of the farm buildings, and maples shade the farm lawn. Some of the easy possibilities are Clover Knoll, River Scene, Eastwood, East Grove, Maple Drive, Farview, River Prairie, Many Oaks, Overlook, The Knoll, River Knoll, or Maple Knoll. These are all attractive names and any one of them might be selected, but all of them disregard the outstanding feature of the farm, the landmark called Monument Rock. The owner wisely named the farm after this outstanding feature.

Similar names from the characteristic features of the farm are such as Seven Springs, Loudwater, and Old Forge.

Many of the name beginnings given in the lists that follow will combine well with the name endings to form a suitable name. In some cases the word *farm* may be added, as in Birchdale Farm. Sometimes such names as Long Meadows, Shorewood, Rockmont, or Quietdale are appropriate without the word *farm* following.

NAME BEGINNINGS

DERIVED FROM PLANT LIFE

Acorn	Corn	Meadow
Alder	Cottonwood	Meadowsweet
Apple	Crabapple	Oak
Arbor	Cress	Orchard
Arbutus	Crowfoot	Pasture
Ash	Elder	Pennyroyal
Aspen	Elm	Pine
Balsam	Evergreens	Primrose
Basswood	Fern	Reeds
Beech	Fir	Rock Rose
Birch	Flower	Rose
Bittersweet	Forest	Rye
Bloom	Hackberry	Speedwell
Bluebell	Hawthorn	Spruce
Blue Flag	Hazel	Sumach
Boxberry	Hickory	Tanbark
Brier	Ivy	Thornapple
Burr Oak	Juniper	Tree
Buttercup	Larch	Trefoil
Butternut	Linden	Wheat
Calamus	Mallow	White Thorn
Cedar	Maple	Windflower
Cherry	Marigold	Witch Hazel
Columbine	Mayapple	Wood

DERIVED FROM ANIMAL LIFE

Badger	Crow	Mink
Bald Eagle	Deer	Otter
Baldpate	Elk	Partridge
Bear	Fox	Porcupine
Beaver	Hawk	Raccoon
Bees	Heron	Robin
Bird	Hound	Squirrel
Black Hawk	Killdeer	Sturgeon
Bluebird	Kingfisher	Swallow
Bob White	Lark	Thrush
Carcajou (Lynx)	Lynx	Whippoorwill
Chickadee	Mallard	Wolf

DERIVED FROM MINERALS, LAND, AND WATER

Bay	Forest	Pinnacle
Brook	Glen	Prospect
Boulder	Granite	Quarry
Cave	Headlands	Ridge
Cliff	Heath	River
Copper	Highlands	Rock
Craig	Hill	Shore
Creek	Hillside	Spring
Crest	Iron	Stone
Dale	Knoll	Summit
Flintstone	Lead	Uplands
Ford	Lookout	Valley
Fork	Mound	Water

DERIVED FROM MISCELLANEOUS SOURCES

Airy (Airy Knoll)	Many (Many Brooks)
Bald (Bald Hill)	May (Mayfield)
Big (Big Cottonwood)	Mill (Millmount)
Black (Blackstone)	Nether (Netherhill)
Blue (Blue Valley)	New (Newmill)
Bow (Bow River)	Old (Oldforge)
Breeze (Point Breeze)	Pleasant (Pleasant Mount)
Bridge (Bridge Water)	Quiet (Quietdale)
Broad (Broadwater)	Red (Redgate)
Camp (Campsite)	Rich (Rich Pastures)
Cold (Cold Springs)	Rocky (Rocky Ridge)
Crescent (Crescent Fork)	Round (Round Hedge)
Cross (Cross Oaks)	Sandy (Sandyforks)
Deep (Deepwoods)	Seven (Seven Oaks)
Fair (Fair Valley)	Shepherd (Shepherds Banks)
Farming (Farmingwood)	Short (Shortridge)
Ferry (Ferry Road)	Silver (Silverlands)
Flat (Flat Rock)	South (Southacres)
Free (Freelands)	(Use east, west, and north in same way)
Full (Fullbrooks)	Steep (Steeprock)
Gay (Gaybrook)	Stony (Stony Knob)
Glad (Gladwater)	Summer (Summerhill)
Grantlands	Sunny (Sunnybank)
Great (Great Meadow)	Sunrise
Green (Green Bank)	Sunset
High (High Elms, Highbank)	Swift (Swift Rapids)
Hope (Hopefield)	Tall (Tall Pines)
Lone (Lone Tree)	Thick (Thickthorn)
Long (Longbridge)	Twin (Twin Oaks)
Lost (Lost Spring)	Two (Two Hills)
Loud (Loudwater)	
Low (Low Hill)	

NAME ENDINGS

Acres	Hall	Peak
Arbor	Heath	Place
Bay	Heights	Pool
Bank	Hill	Pond
Bluff	Hillside	Portage
Bow	Holt	Prairie
Branch	Hollow	Rapids
Bridge	Home	Ravine
Brink	Homestead	Ridge
Brook	House	River
Brow	Hurst	Road
Camp	Island	Rock
Cliff	Isle	Run
Corner	Kiln	Shire
Coulee	Knob	Shore
Crag	Knoll	Side
Creek	Lair	Slopes
Crest	Lands	Springs
Croft	Lake	Stead
Crossroads	Lane	Stone
Dale	Lawn	Summit
Dell	Leaf	Town
Downs	Leigh	Trail
Drive	Lock	Tree
Ferry	Lodge	Turnpike
Fields	Lowlands	Vale
Fold	Mead	Valley
Ford	Meadows	View
Forest	Mill	Wald
Fork	Mine	Wash
Fort	Mont	Water
Gables	More	Way
Garden	Mound	Well
Gate	Mount	Wellhead
Glen	Nest	Wood
Grange	Nook	Woodland
Grove	Orchard	Wold
	Pastures	

INDIAN NAMES

CHIPPEWA

- Antigo (an' tee go)—green
 Awassaki (ah wus sah' kee)—beyond the hill
 Biwamo (bee wah' muh)—a trail
 Mekunna (mee kun' nah)—the road home
 Minoaki (min noh ah' kee)—good land
 Muskoday (mush koh day')—prairie
 Muskeego (mush kee' go)—cranberries
 Negaunee (nee gahn' nee)—he walks ahead; a pioneer
 Odana (oh day' nah)—a town
 Pensaukee (pen sah' kee)—the place where land grants were made
 Sibiwan (zee' bee wun)—several rivers
 Wabun (wah' bun)—dawn
 Wabisi (wah bee' zee)—swan
 Wanaki (wah' nuk kee)—he lives in peace; the free dweller
 Washkama (wash kah' mah)—the road is crooked

MENOMONI

- Akamia (ah kah' mia)—across the river
 Iawis (i ah' wees)—first
 Ishpekan (eesh pay' kahn)—it is high
 Maskotia (mah skoh' tia)—prairie
 Mechikan (mee' chee kan)—a road
 Nakisit (naw kee' sit)—easily seen
 Okawa (oh kaw' wah)—fish
 Osekan (oh say' kahn)—grass
 Otsipe (oht see' pay)—tree stump
 Owasse (oh wah' shay)—bear
 Pakanawe (pah kah' nah way)—butternut tree
 Peswaba (pay swaw' bah)—dawn
 Wakinin (waw kee' neen)—crooked river
 Wekiwam (wek kee' wahm)—house
 Wikomik (wee kum' mek)—a house of logs

WINNEBAGO

- Acooda (aw coo' dah)—come
 Heskadak (hay skah' dak)—linden
 Nacooda (nah coo' dah)—trail
 Nechoerra (nee och er' rah)—mouth of river
 Ohoocheda (oh hoo hee' dah)—the four winds; points of compass
 Tayerra (ty er' rah)—lake
 Taychopera (ty cho per' rah)—the four lakes
 Wache-Etcha (wah chee etch' ah)—my place
 Waseda (wah zhee' dah)—pine tree
 Washara (waw schar' rah)—beautiful
 Washkada (wahs kah' dah)—popple tree

OTHER INDIAN LANGUAGES

- Aspatock—high land
- Cadoma—hidden
- Casco—resting place
- Cohasset—place of the pines
- Dockmachie—maple-leaved viburnum
- Hantonwan—end of the village
- Ioka—beautiful
- Kampeska—bright and shining
- Kasota—sky free from clouds
- Katahdin—highest place
- Lakota—friends
- Mahaska—white clouds
- Minaukee—country of berries
- Minneota—plenty of water
- Monquamin—corn
- Natick—the place of hills
- Oacoma—the place between
- Osawentha—by the pines
- Oshawa—across the river
- Pequannock—cleared land
- Sappomah—deep waters
- Taycheedah—camp on the lake
- Tekemah—big cottonwood
- Tintonwan—prairie dwellers
- Tioga—at the forks
- Tuscola—a level place
- Wakama—a bargain
- Watonwan—plenty of fish

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THE FARM NAME TEST

Check Your Farm Name Against This List

I. CONSIDER ITS USE

1. Is it a name for your home of which you will be proud?
2. Is the name valuable in your business?

II. HAVE IT DIFFERENT FROM OTHER NAMES.

1. Does it add dignity to your business?
2. Does it characterize your business?
3. Does it name some outstanding feature about your farm?

III. SELECT A NAME THAT WILL LAST.

1. Can it be sold with the farm?
2. Will your children be proud of it?
3. Is it pleasing to ear and eye?
4. Is every feature of the name enduring?



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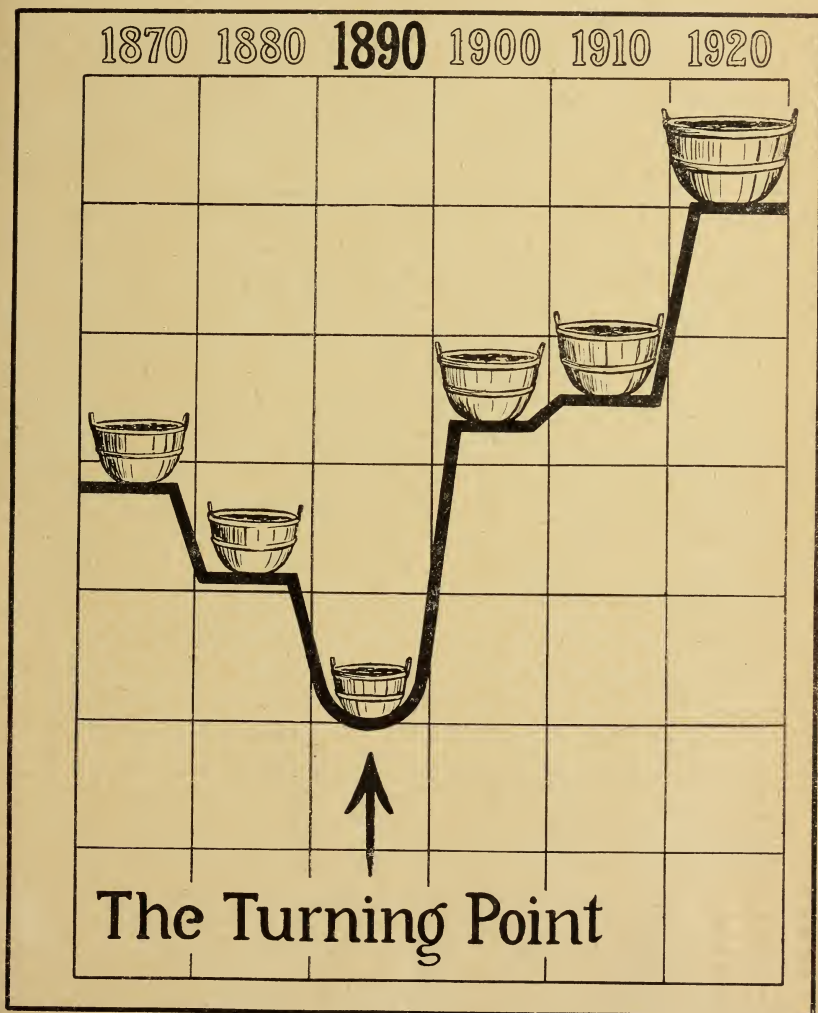
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Circular 131

Ag. Serv.

UNIVERSITY OF WISCONSIN
MAR 23 1921 January, 1921

Pages of Progress



ANNUAL REPORT OF
THE AGRICULTURAL EXTENSION SERVICE
UNIVERSITY OF WISCONSIN
MADISON

“Give fools their gold,
And knaves their power;
Let fortune’s bubbles
Rise and fall;
Who sows a field,
Or plants a flower,
Or trains a tree,
Is more than all.”

—*Whittier*

Pages of Progress

H. L. RUSSELL AND K. L. HATCH

The decade ending with the year 1890 marked the "ebb tide" in American agriculture. This date is the turning point in Wisconsin farming. Besides marking the change from a single crop system to diversified farming it also marks the date of the discovery of the Babcock test and the founding of the Wisconsin Dairy School, two definite steps toward making Wisconsin what it now has come to be, "The Leading Dairy State."

On the cover of this report is a chart full of promise. Wisconsin has always outranked the national average in her crop production. When Wisconsin's land was first opened to agriculture it gave yields much higher than the nation's average because of its high fertility. The longer it was farmed, however, the poorer became the crop, until in 1880 the average acre yield was reduced almost to the national level.

Why? Because Wisconsin was then practicing a single crop system of farming with but little stock, selling wheat and returning little or no fertility to the land. In this disastrous decade, from 40 to 50 per cent of all her grain acreage was devoted solely to wheat; and more acres were then planted to wheat than were seeded to hay and forage.

Since 1890, however, Wisconsin has been rapidly changing to a dairy and live stock state, and developing—of necessity—a more diversified system of agriculture. This is easily seen by comparing the increase in the number of dairy cows with the changes that have come about in the acreage of hay and forage, wheat and other cereals.

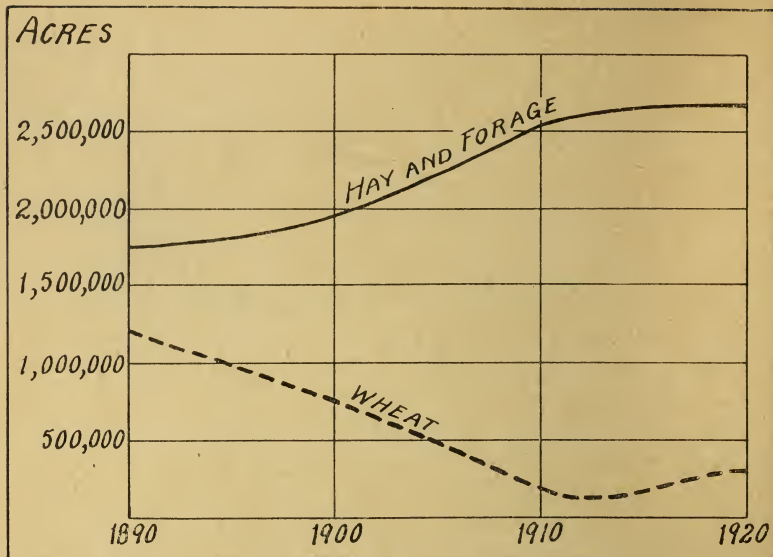


FIG. 1.—DAIRY COWS DRIVE OUT WHEAT

As the acreage of hay and forage increased, wheat steadily declined.

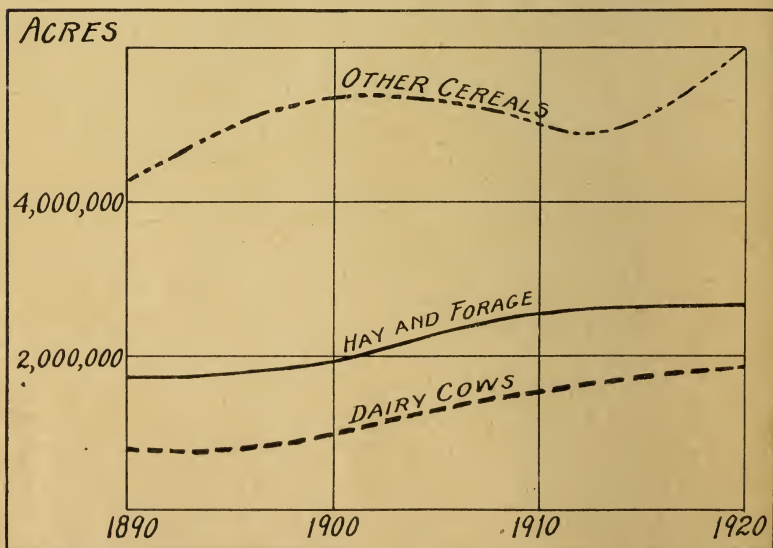


FIG. 2.—WHEAT WAS PARTLY BUT NOT WHOLLY REPLACED BY OTHER CEREALS

The acreage of hay and forage, however, kept pace with the increase in the number of dairy cows.

This change has been brought about through various educational forces, chief among which are:

1. The agricultural press.
2. The farmers' institutes.
3. The various farmers' organizations.
4. The agricultural college, and secondary agricultural schools.

POWER OF THE PRESS

How large a place the printed page has occupied in this development may be judged by studying the subscription lists of the state's agricultural press during this same period. The

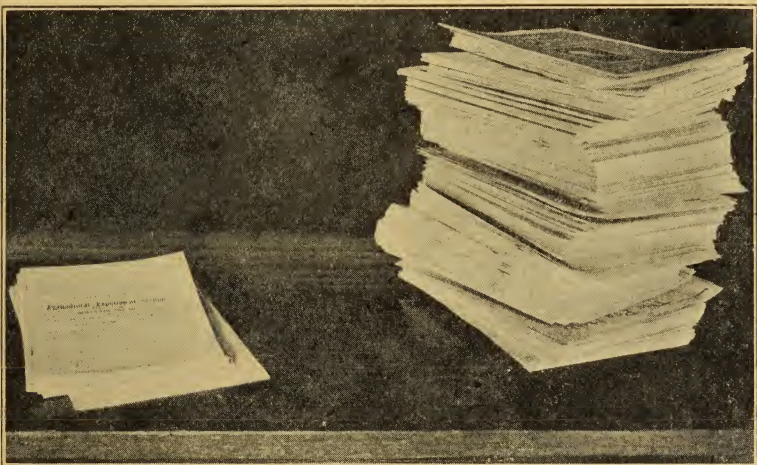


FIG. 3.—THEN AND NOW

Thirty times as many bulletins are now distributed as in 1890. During the same period the paid circulation of farm papers within the state has increased correspondingly. By far, the large majority of Wisconsin farmers now take and read regularly one or more farm papers.

publication and mailing lists of the agricultural college also furnish additional information on this point, covering the same period.

GROWTH OF AGRICULTURAL TEACHING

Another interesting side light is furnished by the student lists

of the agricultural college and the agricultural high schools of the state.

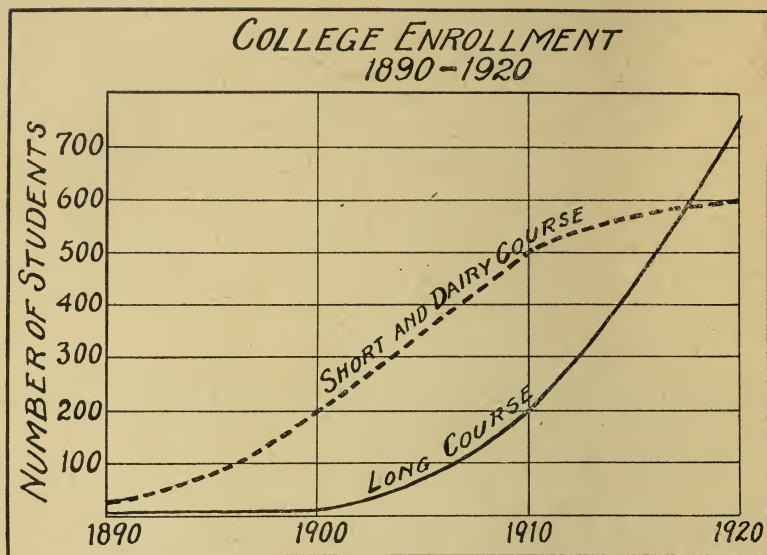


FIG. 4.—COLLEGE TRAINED FARMERS

In 1890 the college-trained farmer was a rarity. Since that time the number of short and long course students taking college training has grown enormously. It must also be remembered that during the past ten years a large number of boys have been receiving agricultural training in the secondary schools of the state.

THE EXPERIMENT STATION A SOLID FOUNDATION

The principal sources of agricultural information are the experiment stations of Wisconsin and other states, and the United States Department of Agriculture. Without this substantial body of scientific knowledge, so carefully collected, college teaching would soon become sterile and ineffective; the agricultural press would exert much less influence for good; and the work of the farmers' institutes and of the extension service would be fruitless.

It is the purpose of this circular to show in graphic form some of the results achieved by Wisconsin farmers since the "Turning Point" and to indicate some of the means that were used by the agricultural extension service during the past year in further developing the agriculture of the state.

IMPROVING WISCONSIN CROPS

(Agronomy Department—R. A. Moore, In Charge)

About 25 years ago the Wisconsin Experiment Station set about the breeding of pedigree grains in a small way. A few years later (1906) the Wisconsin Experiment Association was organized for the purpose of giving immediate statewide dissemination to the improved strains resulting from this painstaking effort.

The grains that have been given most attention are corn, oats, barley and rye. Partially because of the wide use of better seed, and partly because of better soil cultivation and treatment, this state has steadily increased its average yield per acre of all of these crops. It has also continued to raise its average acre yields much above those of the nation at large.

A glance at these charts will reveal the rapid advance of the past ten years, the period of widest use of improved varieties and expanding interest in agricultural teaching.

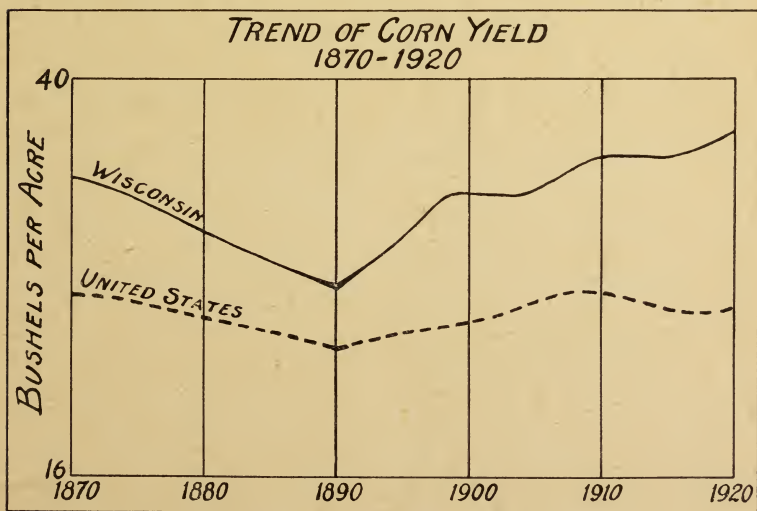


FIG. 5.—ALWAYS AT THE TOP

The average acre yields of Wisconsin crops have always been higher than those of the United States as a whole. The above chart shows the general corn trend by ten year periods, 1890 being the low point for both state and nation.

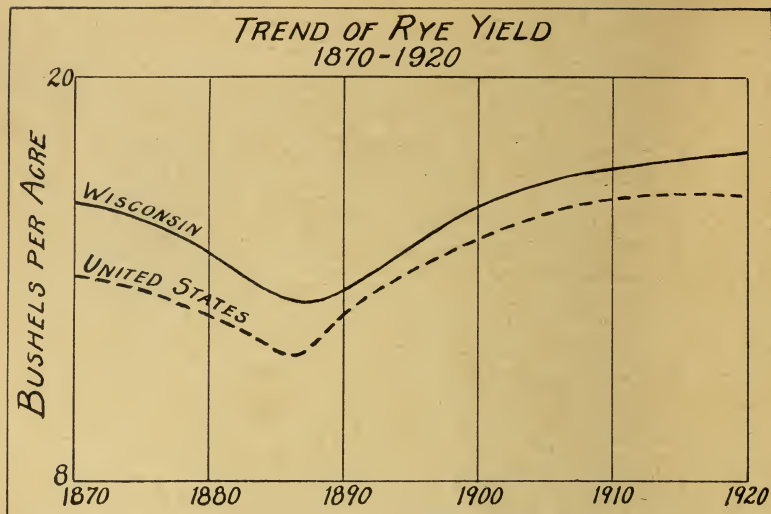


FIG. 6.—WHY PEDIGREE GRAINS?

During the past ten years Wisconsin pedigree grains have come into general use throughout the state. This influence is seen in the continued rise of Wisconsin production above the average of the United States.

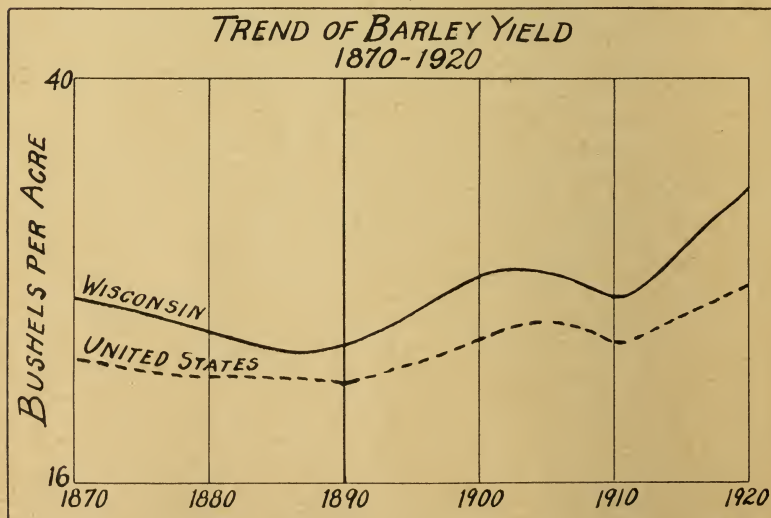


FIG. 7.—THE LOW POINT

It is a striking fact that 1890 is the low point in the production of all our principal crops. Whether these charts are taken singly or in combination 1890 stands out conspicuously. It is indeed "the turning point" in American agriculture.

PURE BRED GRAINS

The use of pure bred grains has now become general throughout the state with the result that since 1910 there has come a sharp upward turn in the average yields per acre of all of these crops as shown by Table I.

The actual cash value of the increase over the preceding decade in the value of the crops raised on the same area of ground, as a result of the combined use of pure bred seed and better cultural practices, is enormous.

For the ten years just closed, the value of the annual increase on our five principal crops—the ones that have been pushed most vigorously and have the largest acreage—is as follows:

TABLE I.—VALUE OF ANNUAL INCREASE IN FIVE PRINCIPAL CROPS

Crop	Average acreage	Increase per acre	Farm price per bushel	Farm value
Oats.....	2,325,000	4.9 bu.	\$0.48	\$5,425,000
Corn.....	1,600,000	3.3 "	.87	4,350,000
Barley.....	700,000	1.2 "	.84	705,000
Rye.....	400,000	.4 "	1.04	166,400
Potatoes.....	300,000	11.2 "	.72	2,520,000
Total for one year				\$13,166,400
Total for decade				\$131,664,000

SOME NEW CROPS

SOYBEANS

(G. A. Briggs, Specialist)

Soybeans, but recently introduced into Wisconsin's already diversified system of farming, have made substantial progress during the past few years. This annual legume is particularly adapted to sandy lands because it furnishes the necessary nitrogen—in which such soils are usually deficient—as well as a protein rich feed for live stock.

The usual method of introduction is to select as "demonstrators" a few farmers in each county who are particularly

interested in the crop. Fields of soybeans are planted on these farms and at some favorable time during the growing season a soybean "tour" is made of these farms. The local county agent gives wide publicity to these tours thus interesting many of the local farmers in making the trip. The number of persons taking part varies from 30 to 100 or more. This method gives each farmer an opportunity to "see for himself" and thus be better

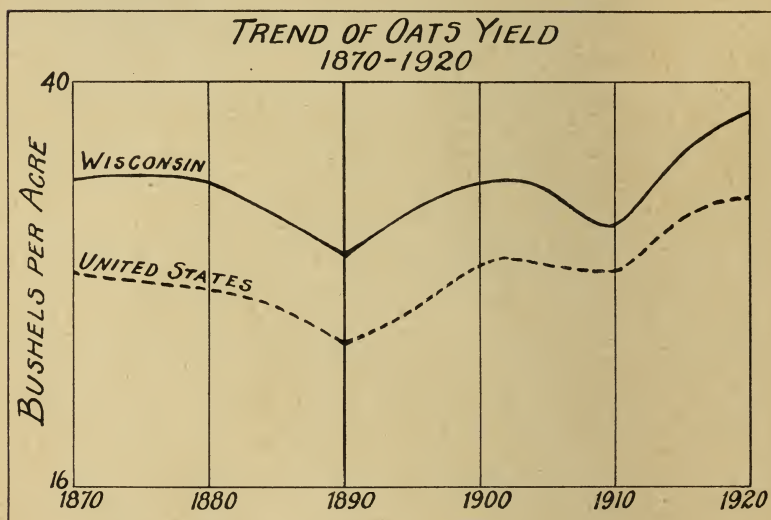


FIG. 8.—OATS IMPROVED BY BREEDING

Since the widespread distribution of pedigree oats just prior to 1910 the average yield per acre has taken a sharp upward turn.

able to judge as to the desirability of this crop for seed, hay silage, green manure or emergency hay crops for his own use.

This general plan of work was carried out in 26 counties of the state during the past year. While soybean growing has not as yet assumed large proportions it gives promise of becoming one of Wisconsin's staple crops.

ALFALFA

(L. F. Graber, Specialist)

An increase in Wisconsin's alfalfa acreage from 17,000 acres in 1910 to 87,000 acres in 1920 is a substantial reply to the question, "Has alfalfa education been effective?"

Intensive alfalfa "drives" have been waged during the past two years in Washington, Sheboygan, and Winnebago Counties. The best evidence of the value of this work is shown by the assessor's report of the acreage in Washington County, as follows:

1918	-----	772	acres
1919	-----	1907	"
1920	-----	4000	"



FIG. 9.—1,000 FARMERS SAW THIS DEMONSTRATION

The difficulty of obtaining genuine hardy varieties of alfalfa seed was particularly emphasized.

INOCULATION FOR SOYBEANS AND ALFALFA

(Bacteriology Department—E. G. Hastings, In Charge)
(E. B. Fred, Specialist)

The successful culture of this crop is dependent upon the presence of the necessary bacteria in the soil. Soils on which this crop has never been grown, seldom contain these germs. Therefore it must be "inoculated". The College, as in former years, has continued to supply legume cultures. The amount distributed this year was sufficient to inoculate the seed for

30,000 acres of soybeans and other legumes, including field peas, clover and alfalfa.

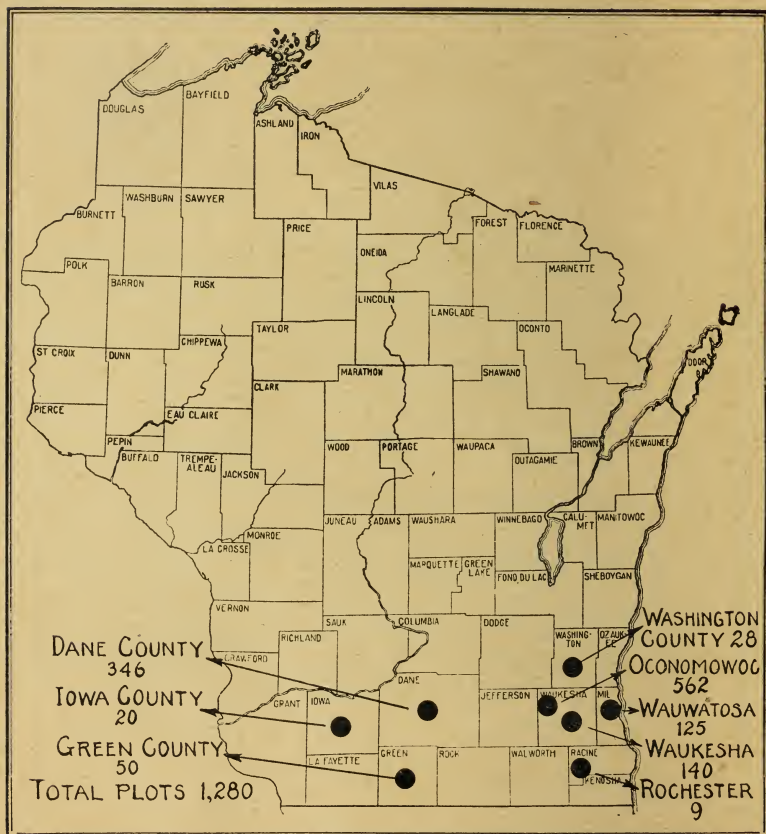


FIG. 10.—WHERE ALFALFA DEMONSTRATIONS WERE HELD

The dot indicates the location of the plots—the figures show the number of plots in each county.

HEMP

(A. H. Wright, Specialist)

The steady growth of the hemp industry, which was inaugurated by the College of Agriculture as a means of eradicating noxious weeds, has placed Wisconsin in the first rank as a hemp fibre producing state. The application of scientific methods of

production and harvesting, coupled with the use of improved machinery and a thorough organization of the marketing methods, has given the state in a few years an industry already worth a half million dollars annually.

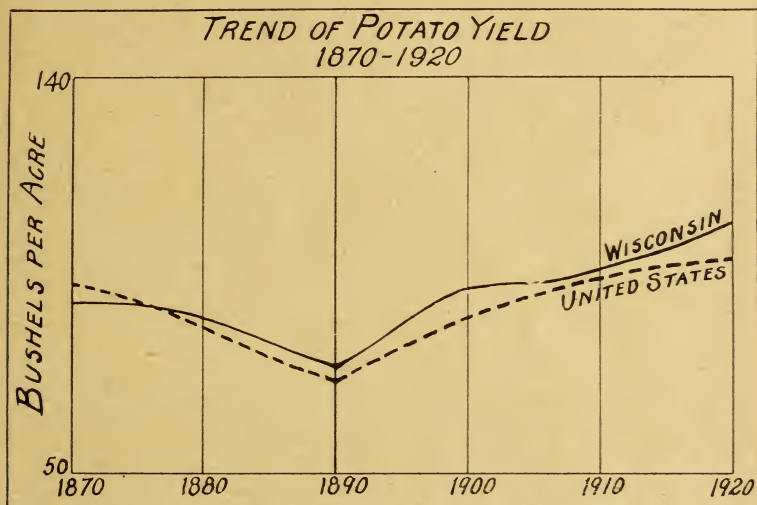


FIG. 11.—WHAT ABOUT POTATOES?

In potatoes, too, 1890 is the turning point, but here again Wisconsin's average holds well above that of the rest of the United States.

THE WORK FOR POTATO IMPROVEMENT

(Horticulture Department—J. G. Milward, Specialist)

The effort to improve potato seed stock through certification and the use of this improved seed in the production of market table stock has been pushed along the same lines as in former years.

To further emphasize the value of using better seed, automobile excursions were planned and run in all the leading potato counties when fields were visited, and comparisons made by the 1500 potato growers participating.

DAIRYING AND LIVESTOCK ADVANCE TOGETHER

(Animal Husbandry Department—G. C. Humphrey, In Charge)

With the development of dairying and the consequent changes in Wisconsin crop production, new problems arising out of this diversified system began to demand solution.

The need for better dairy cows and for more economical dairy and meat production stands out conspicuously. In addition to the pure bred sire campaign, which has been vigorously pushed during the past two years in connection with the Wisconsin Live Stock Breeders' Association, and the regular cow testing association work which for several years has been carried on jointly by the College and the Wisconsin Dairymen's Association, there were inaugurated this year two new projects. One was for the transfer of high bred dairy calves from the whole milk section to the rapidly developing cutover areas of the state and the other was planned to meet the demand for economical pork production.

THE TRANSFER OF DAIRY CATTLE

(A. O. Collentine, Specialist)

The rapidly expanding whole-milk area of Chicago and Milwaukee, coupled with the unusual development of the condensed milk business in the same territory, has created a new problem for southern Wisconsin dairymen. After spending years of patient effort in grading up their herds, whole-milk producers now find it unprofitable to raise their own dairy cattle from these high producing cows. Where the situation is most acute, these farmers depend entirely upon outside sources for their dairy stock.

On the other hand, farmers in the rapidly developing northern part of the state are under the necessity of grading up herds from common native stock.

Consequently the effort has been made this year to transfer heifer calves from the high grade cows of the whole milk district—which would otherwise go to slaughter—and thus save 10 or 15 years of breeding work to the pioneer farmer. At the same

time a future supply of dairy cattle is insured to the whole milk district, the surplus, if any, being available for our ever expanding export trade.

The extension service recognizes that to continue emphasizing production, without carefully laying the foundation for a successful means of distribution and sale of surplus stock, will sooner or later result in a breakdown of the industry. A ready market for dairy cattle not only makes a surplus profitable but also regulates the supply of milk and resulting dairy products.



FIG. 12.—HOW TEN YEARS ARE SAVED TO THE BREEDER

Grade heifer calves from Jefferson County.

The dairy cattle centers developed under the community breed association plan, disease free herds, production records and lists of available supply, all are incentives to the prospective buyer. In the development of these agencies the extension service has had a prominent part. As a result, the past year has shown the largest trade in dairy cattle in the history of the state. A careful checking of the sales held in sales pavilions during the past year reveals the fact that over \$1,000,000 of stock was sold through this channel alone. Add to this the numerous other means of dairy cattle exchange and the total transfer value exceeds \$3,000,000!

The extension service itself can be directly credited with bringing into the state over 100 buyers from 14 different states. Many of these buyers who were connected with the Boys' and

Girls' Club and County Agent systems in other states, took out of the state several car loads each of dairy cattle. This is in addition to numerous internal transfers between various counties of the state made largely through the instrumentality of county agents.

MORE ECONOMICAL PORK PRODUCTION

(M. H. Scott, Specialist)

Next to the dairy cow, the pig is the most economical producer of human food. Pork furnishes 40 per cent of all the fat consumed by the nation and as a national food stands second only to wheat. Pork, wheat and dairy products together furnish nearly 60 per cent of the nation's total food supply. The more economical production of pork is therefore a very important problem to Wisconsin farmers.

The extension service has followed the experiment station in its findings, and this year has carried on demonstrations along three lines:

- (a) More pigs to the litter as a result of better winter care of the brood sow.
- (b) More pork from less feed by use of pasture.
- (c) More constant and regular gains from use of the self-feeder.

Twenty-nine such demonstrations were carried on in various parts of the state and each concluded with a demonstration meeting at the close of the season. The largest meeting of the kind was on the farm of Tews Brothers, near Hanover. The attendance was 2500, a crowd altogether too large for effective work.

"BOOST BETTER BULLS" BRINGS RESULTS

(D. S. Bullock, Specialist)

Thirty-six counties are now definitely organized for the purpose of eliminating the "scrub" bull; in fact, the entire state has taken an active interest in this work. Every herd in each of 47 Cow Testing Associations is now headed by pure bred males. Judging by the effective work of the past two years, carried on in cooperation with the Wisconsin Live Stock Breeders' Association—which has resulted in adding not less than



FIG. 13.—WINNEBAGO'S BEST

Calf club prize winners at the Wisconsin State Fair 1920.

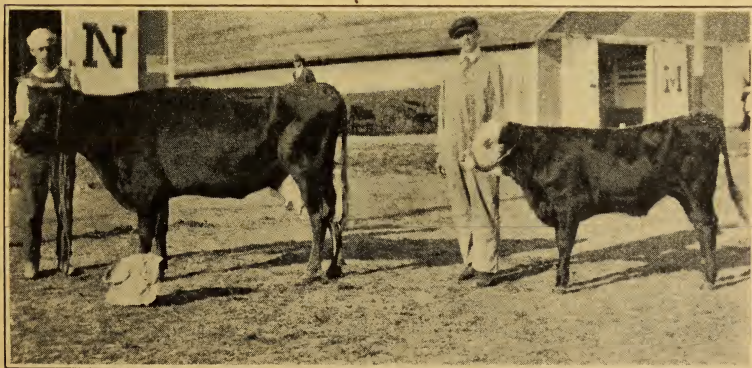


FIG. 14.—DO PURE BRED BULLS PAY?

A common cow and her offspring by a pure bred Hereford bull.

10,000 pure bred bulls to the herds of the state—it will be only a short time until the “native” or “common” cow will have followed the buffalo to extinction.

ANIMAL DISEASES

(Veterinary Department—F. B. Hadley, In Charge)

As in the past, the College of Agriculture has continued to supply the necessary tuberculin used for the control and eradication of tuberculosis in cattle.

While all regulatory work has been placed in the hands of the State Department of Agriculture, the college continues to supply the necessary laboratory facilities for the preparation of serum, tuberculin and vaccine, in addition to the direct diagnosis of 3623 diseased specimens sent in by both farmers and veterinarians during the year. By the use of direct and accurate scientific diagnosis it is becoming more and more easily possible to check the spread of contagion before it has gained a foothold or caused havoc.

BETTER SOIL MANAGEMENT THE BASIS OF PROGRESS

(A. R. Whitson, In Charge)

As a result of the change in Wisconsin agriculture from a single crop system to one of diversified farming with dairying as the leading industry has come the recognition of the “soil as the farmers’ fundamental asset.” It is idle to claim that all the progress of the past 30 years is due to education alone. Unseen economic forces have been at work of which the great majority of persons were unaware. Intensive dairy farming necessitates better feeding. Better feeding ordinarily requires the use of purchased concentrates which in themselves contain the very fertilizing substances so essential to plant growth. As a result, the soils of the state are being gradually raised again toward their original fertility level. This fact, together with the use of better seed and the application of better cultural practices, accounts for the remarkable progress of the past 30 years.

THE WORK OF THE STATE SOILS LABORATORY

(E. J. Gaul, Chemist)

To find out exactly what the soil needs on any particular farm requires the services of a trained chemist. To provide such

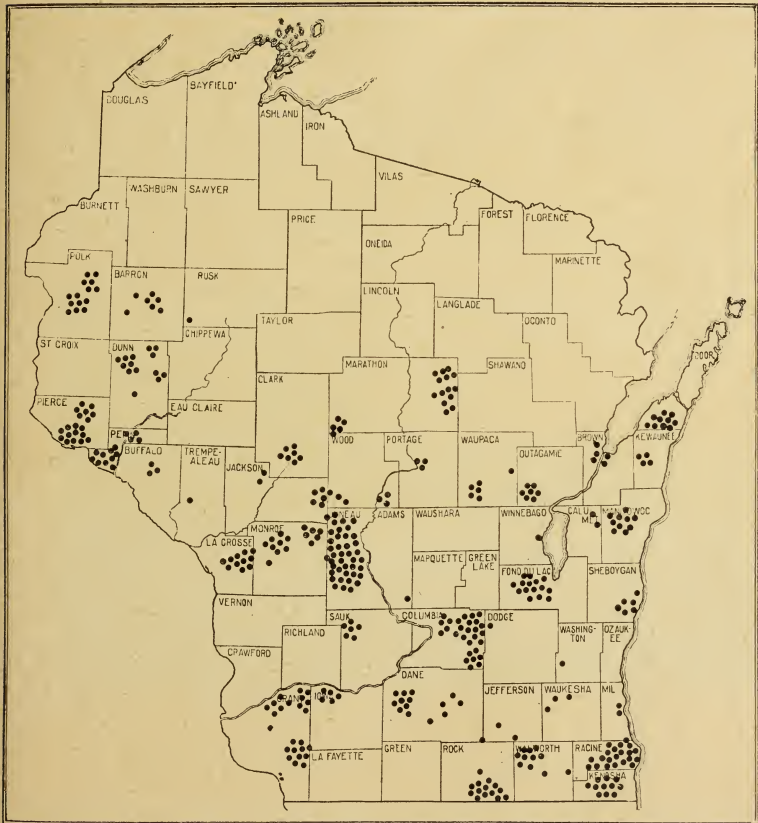


FIG. 15.—WHERE SOILS WERE STUDIED

All the farms indicated by the dots on the map were personally visited by the soil specialists and analyses made for the farmers.

service the state soils laboratory was opened. Extension workers and county agents collect soil samples from individual farms and send them to the laboratory where they are analyzed. This analysis, taken together with a study of the crop history and a personal examination of the field, enables the laboratory to determine the kind and quantity of the fertilizer required.

During the past year over 600 analyses have been made, and half as many personal examinations were made for individual farmers.

Wherever five or more farmers in the same neighborhood have been given such assistance they have been organized into groups for further study and demonstration of methods of soil improvement. Nine such groups have been added to the number during the year just closed. A bird's eye view of this work is given in the map.

FERTILIZER AND LIME TRIALS SUCCESSFUL

(G. Richards, H. W. Ullsperger, F. L. Musbach, Specialists)

In addition to the soil analyses made by the state soils laboratory, 620 tests for acidity of individual soil samples were



FIG. 16.—WHAT FERTILIZER DID

The corn at the right received the fertilizer. Its effects are easily seen.

made to determine the amount of lime which must be added. As many of these tests as possible have been followed up with actual demonstrations of the results obtained from the use of lime.

In a similar manner, trial plots have been run in conjunction with the work of county agents on farms to determine fertilizer requirements. These have been so numerous that no records have been kept of the actual number but the results have been made available to thousands of farmers through summer tours and demonstration meetings.

ADDING NEW ACRES

*(Agricultural Engineering Department)**(E. R. Jones, In Charge)*

Many new acres are added annually to the state's productive area through reclamation of marsh and "cut over" land. In this work the extension service plays an important part. Under state law, the drainage engineer is charged with the responsibility of deciding whether or not any proposed drainage is practicable. For the most part such districts include all the principal outlet or main ditches, the laterals or individual tracts being left to the farmers. If these districts are to achieve their purpose the laterals on the individual farms must be properly installed.

DRAINAGE

(G. R. B. Elliott, Specialist)

Forty-eight farm drainage demonstrations have been made during the past season. The work consisted of preliminary surveys and in twelve cases of actually staking out the drains.

The demonstration on the farm of John B. Timbers of Mauston is typical. The county agent and the drainage engineer visited the farm together and found that an 8 inch tile would serve the purpose better and be cheaper in the long run than an open ditch. Hubs were then set every 100 feet and notes made on the proper depth of the tile at each hub. This enabled the tiler to do his work properly.

The organization of drainage districts, the making of preliminary surveys, and the actual demonstration of proper drainage on the farmer's own land for the current year cover a total of nearly 100,000 acres, which will ultimately add \$10,000,000 to the landed wealth of the state.

LAND CLEARING

(J. H. Swenchart, Specialist)

The four leading features of land clearing work were:

1. The demonstration and distribution of T N T

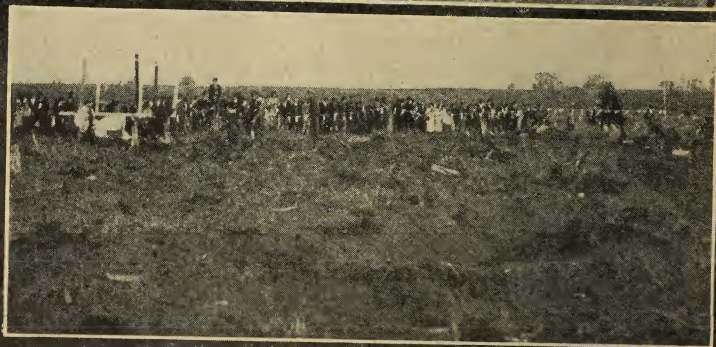


FIG. 17.—A WHOLE ACRE AT ONCE

At the close of the Marinette County land clearing campaign a whole acre was blown at one shot. The pictures show the three stages of the operation.

2. The holding of land clearing schools
3. Demonstration of land clearing methods at meetings
4. Assistance in the conduct of land clearing contests.

About 550,000 pounds of T N T were distributed at cost of cartridging and distribution; and farmers were instructed in its proper use through demonstration meetings. The distribution of T N T during the autumn of 1919 created an enthusiasm for land clearing work which resulted in doubling the use of explosives during the current year. In 1920, over 3,250,000 pounds of dynamite and T N T were used in the state. Wisconsin now uses more explosives for agricultural purposes than any other state in the union. Much of this activity comes back to the operation of the land clearing demonstration trains that have been run for four years.

Land Clearing schools were held in each locality where land clearing contests were organized by local people in Marinette, Rusk, Sawyer, Ashland and Taylor Counties. By these means and by local meetings it was possible to reach over 20,000 pioneer farmers with instruction and demonstration in land clearing work.

Some idea of the value of educational work in land clearing may be had from the experience of Marinette County. In this county the local organization employed a man to head the drive which resulted in the clearing of 18,000 acres of new land, six times as much as was opened to agriculture in any preceding year.

THE FARMERS' FIGHT AGAINST PESTS

Since 1890, has come a change in the farmer's fight against pests which seek his undoing. Thirty years ago he was too often hopeless and powerless under their attacks. Today he wages a constant and effective warfare against them and rightfully acknowledges the service of science in this combat.

THE PLAGUE OF PLANT DISEASE

(Plant Pathology Department—L. R. Jones, In Charge)

(R. E. Vaughan, Specialist)

Demonstrations for the control of grain, cabbage, and potato diseases were carried on in 11 counties. These were combined

with field trips and summer and winter demonstration meetings by means of which over 6,000 farmers were shown how to control plant diseases by use of the best methods discovered up to the present time.



FIG. 18.—IN THEY GO!

Seed potatoes being treated in corrosive sublimate solution (1-1000) before being cut for planting. Field demonstration at Chetek with County Agent R. L. Cuff in charge. The wood tank capacity was 16 bushels.

IMPROVING THE APPLE CROP

(Horticulture Department—J. G. Moore, In Charge)

(F. H. Gifford, Specialist)

As good fruit can be grown in Wisconsin as in any other part of the country, but climatic conditions are often favorable for the development of numerous fruit pests which, if uncontrolled, will seriously affect the crop.

To demonstrate the best methods of orchard pest control, 21 orchards were selected in four of the leading apple producing counties. Since these demonstrations were crowded into a short season, the impossibility of covering a greater territory made it necessary to withhold assistance from several other counties.

On the farm of Ralph Irving near Lancaster, 680 trees were sprayed at an average cost of 34¢ a-tree. Practically all the fruit from the sprayed trees was of excellent quality, while that from the unsprayed trees, which were left for comparison, was unfit for use.

In some cases the gains (from 1,000 to 5,000 per cent) were so large as to be almost beyond the belief of those unaccustomed to the results of spraying work. These results were brought together and exhibited at fairs where they were made available to the many thousands in attendance.

SOME BY-PRODUCTS OF DIVERSIFIED FARMING

Wisconsin presents unusual opportunities for the development of numerous phases of diversified agriculture. Its soil, its climate and its people all favor the introduction of new "cash crops" not so much as main lines of effort but as by-products of dairying, live stock and grain farming.

The importance of the tobacco and the sugar beet industry and the rapid expansion of the hemp and the sorghum acreage are all striking examples. The College of Agriculture is being continually called upon to furnish the necessary scientific information for success with crops such as these. The growing importance of these "side lines" is in itself sufficient testimony of its success in this field.

POULTRY AS A "SIDE LINE"

*(Poultry Husbandry Department—J. G. Halpin, In Charge)
(D. H. Reid, J. B. Hayes, Specialists)*

While there are a few commercial poultry plants in this state, by far the large majority of poultry and eggs produced in Wisconsin come from its farms. While the income from this source on each individual farm is seldom large, properly handled poultry becomes a very profitable side line, because the farm flock is fed during the summer season on grass, weeds and waste materials of relatively little value. It is only during the winter season that the feed question for poultry on the average farm be-

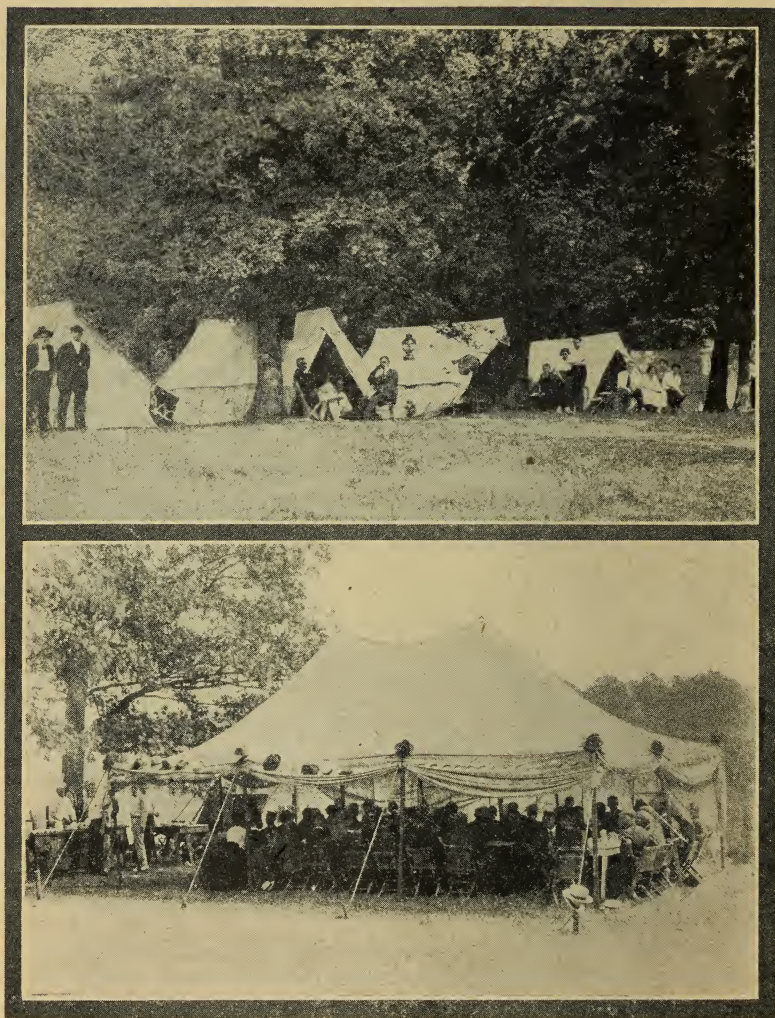


FIG. 19.—BEEKEEPERS' CONFERENCE AND FIELD MEET AT MADISON

1. Living in comfortable style.
2. Lecture tent.

comes important. At this season only producing fowls should be kept. It is the business of the extension service to assist farmers in the scientific selection and feeding of these over-winter fowls.

During the year there have been carried on 204 demonstrations in poultry feeding and culling in all parts of the state. These demonstrations have resulted in sending to market a large per-



FIG. 20.—FEWER HENS BUT MORE EGGS

These culling demonstrations combined with instruction in the right kind of feeding make it possible for the farmer to cut down his flock and at the same time increase egg production.

centage of the non-producing fowls and in the better feeding for production of those that remain over winter on the farms. While this work has been in progress for only two years, its effect is already observed in the increased number of eggs placed on the market.

BEES AND HONEY

(Economic Entomology Department—H. F. Wilson, In Charge)

(H. L. McMurry, Specialist)

Like the professional poultrymen there are also a few large-scale honey producers, but the greatest amount of Wisconsin

honey still comes direct from the general farm where honey is made a more or less prominent side line.

For two years a specialist has been maintained who devotes his time to the interests of the honey producer. Of the 8,000 farmers who keep bees in this state, 1,500 of them have been reached during the year through the medium of bee schools of three days duration and through the local associations of beekeepers. As a result, a keener interest in bee culture is now being shown than at any previous time.

Like poultry, honey production may become a very profitable side line to general farming in the hands of the right man properly equipped with the necessary practical and scientific information.

THE FARMER'S HOME

With the steady advance that Wisconsin farmers have made toward economic independence has come the opportunity for



FIG. 21.—WOULD YOU LIKE TO LIVE HERE?

Neat and attractive farm homes make for a happy and contented rural people.

them to have *comfortable* and *attractive homes* in which the wife's burdens are lightened and her life made more enjoyable.

THE IMPROVEMENT OF HOME GROUNDS

(Horticulture Department—F. A. Aust, Specialist)

Work on the planning and planting of attractive home grounds was undertaken for the first time this year with 18 farmers in six counties of the state. The plan includes furnishing the farmer with a sketch of the rearranged grounds and suggestions for planting largely with native shrubs. In no instance was more than \$18.00 expended for materials. Ninety-three pioneer farmers in Sawyer County and 45 in Chippewa County participated in a "Beautiful Home Grounds" contest.

THE WORK OF HOME ECONOMICS SPECIALISTS

(Home Economics Department—Miss A. L. Marlatt, In Charge)

Mrs. Nellie Kedzie Jones, Leader

Miss Gladys Stillman, Specialist

Miss Gladys Meloche, Specialist

Miss Elizabeth Miller, Specialist

Mrs. Edna D. Walker, Specialist

The demand for the services of women trained in the various phases of the scientific problems of the home is continually expanding. During the year, work has been carried on along the following specialized lines:

Clothing, which includes the proper selection of fabrics for the family, helps in home dressmaking, the preparation of children's clothing, and practical home millinery.

Foods, including canning and other forms of food preservation, the preparation of special food dishes, hot lunches for children, and home gardening.

House Management, covering house furnishing and arrangement, labor saving devices, and household conveniences.

Child Nutrition, which necessarily includes the preparation of foods for children, together with tests and measurements to determine the effects of nutrition.

Women in the homes were reached through the medium of farmers' institutes, the organization of clubs among rural women, county short courses for girls, and a "home makers' camp" at the State Fair.

During the year different phases of this work have been presented to 30,000 women at 348 places in the 44 counties covered by this staff of workers.

The most conspicuous development of the year's work is the county short course for girls, the first one of which was held at Wausau in Marathon County early in the spring. Here 40 country girls from 20 townships, none of whom had ever been away to school, assembled to receive their first instruction in scientific home making from the hands of women trained both in the science and in the art. The course lasted a week during which each girl made herself a two-piece dress which she cut, fitted and finished during the course. Half the time was spent in cooking new dishes, such as "quick breads," egg and milk dishes, salads, salad dressings and simple desserts. In addition to these the girls received instruction in poultry culling, house furnishing and house decoration. The course concluded with a banquet, made possible by the hospitality of Wausau business men, which brought city and country together.

This short course gave the right kind of training, applied at the right place, at a minimum of expense in time and money. The future of country life is dependent upon a contented rural womanhood. If these short courses can be made to further such a condition they mark the beginning of a new epoch in the life of country women.

THE HOME DEMONSTRATION AGENT

(Mrs. N. K. Jones—In Charge)

During the period of the war, food conservation was of great importance. To instruct women in the preparation and use of food substitutes, emergency home agents were placed in many counties of the state by the federal government. As a result of their work, many localities have become impressed with the possibilities of permanent work of similar character carried on by women.

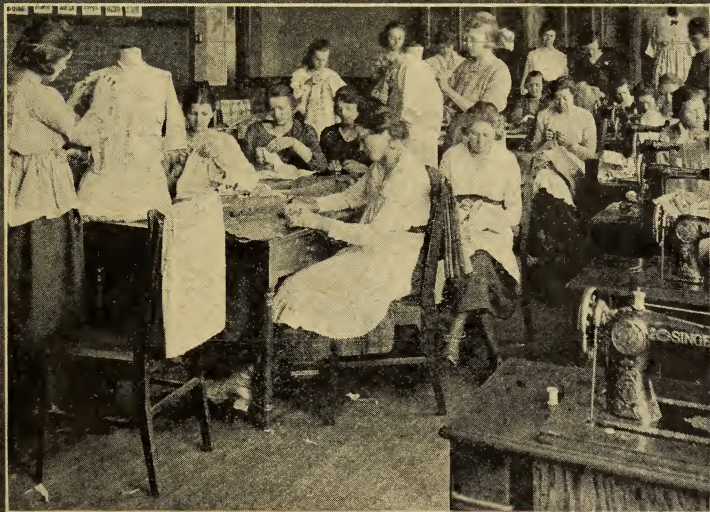
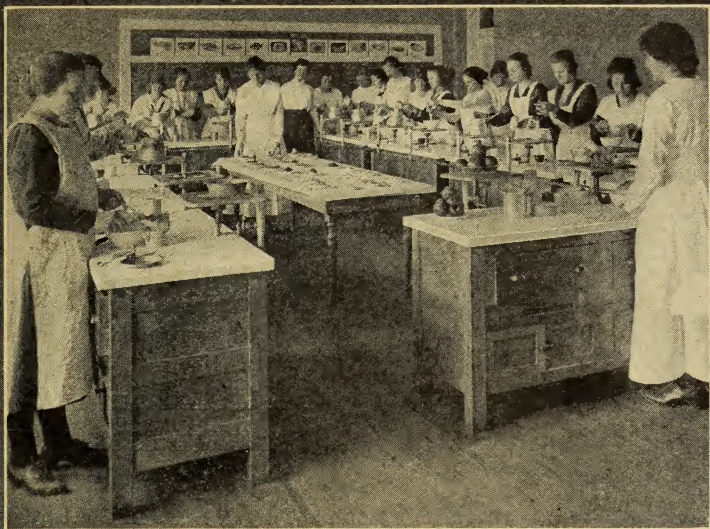


FIG. 22.—AT THE MARATHON COUNTY SHORT COURSE FOR GIRLS

Forty young country girls, who had never been away to school, getting their first lesson in the arts of the home.



FIG. 23.—1. A DREARY OUTLOOK—COLD AND BLEAK. 2. "POLLY PUTS THE KETTLE ON"



FIG. 24.—3. HELPING BROTHER GET READY FOR DINNER. 4. "HOT SOUP"—
HOW COMFORTING!

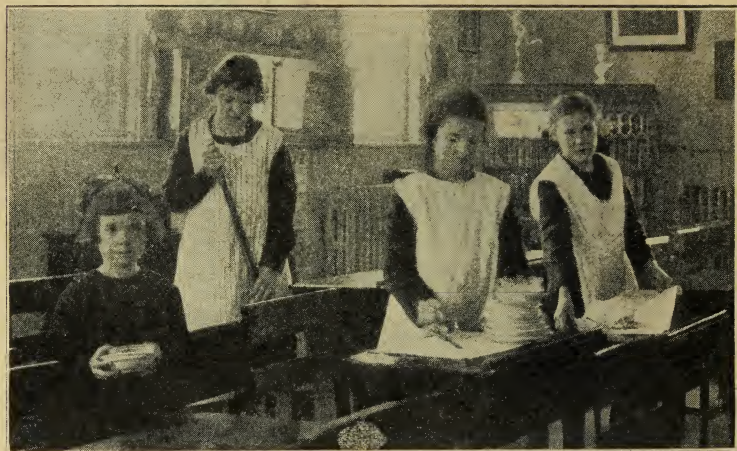


FIG. 25.—5. STRAIGHTENING UP AND GETTING READY FOR WORK.
6. "LITTLE HOUSEKEEPERS"

This year two county boards, Marathon and Marinette, made specific provision for this work and raised the necessary funds for this purpose.

It was largely due to the energy of the home demonstration agent in Marathon County that the girls' short course, already described, was organized. Aside from these, home demonstration agents have been active in the organization of country clubs of



FIG. 26.—“4 H” CANNING TEAMS ARE FOUND IN NORTHERN WILDS

Northern Lincoln County—Florence Dunn, Leader

rural women in promoting better “balanced rations” for children and in the “hot lunch” for rural schools.

WORK WITH BOYS AND GIRLS

(T. L. Bewick, In Charge)

Club work for boys and girls has been one of the fruitful lines of rural education for many years. The interest in this work has in no wise abated.

The most notable advance in club work this year has been made in the organization of calf clubs, in which 1,500 dairy calves were fed by club members, a large percentage of which were actually owned by the boys and girls. As a result more

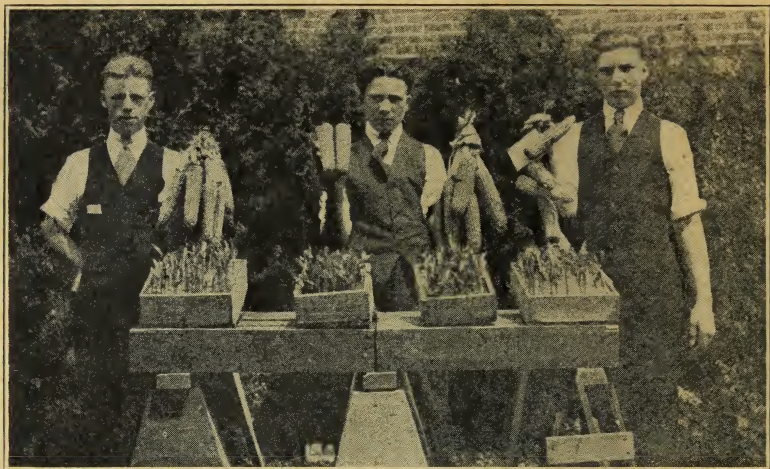


FIG. 27.—CAN THE YIELD OF CORN BE INCREASED?

Jefferson County corn demonstration team telling how they did it.



FIG. 28.—DYEING DEMONSTRATION

Very popular—practical and instructive for girls' clubs.

calves were shown at county fairs this year than ever before in the history of the state: 50 in Winnebago County, 52 in Sheboygan and 87 in Fond du Lac, with a grand total of 146 of the state's best at the Wisconsin State Fair!

Aside from the notable success of the calf club work, that of the demonstration teams in another state fair contest is worthy of especial mention.

Thirty-five teams of three members each, which had successfully withstood the elimination process from 150 teams throughout the state, gave 75 demonstrations to thousands of state fair visitors during the week.

Who can calculate the educational value of work such as this, with 21,000 boys and girls enrolled this year, or its future influence upon the social and economic life of the state! As a work of unusual promise it stands out conspicuously.

THE FARMER AS A BUSINESS MAN

(Agricultural Economics Department—B. H. Hibbard, In Charge)

The occupation of farming is the only one in which the home and the business are closely associated. It is for this reason that the average American farmer has been content, until recently, to run his business without profit. His farm has furnished him a home and for the most part a comfortable living. Of his small investment he took little account.

The decade prior to 1890 was an era of cheap land, but the day of cheap land in Wisconsin has passed. The farmer of today is a user of capital, which must pay, besides other fixed charges, interest and dividends if he is to stay in the business. This necessitates applying the same principles to the business of farming that are found in every other business. For several years the agricultural college has placed much emphasis upon this fact and has sought to assist farmers in the analysis of their own business through the medium of records and accounts.

FARMERS URGED TO KEEP BOOKS

(J. S. Donald, Specialist)

In addition to the economic reasons, state and federal income tax laws make it imperative that farmers keep records of receipts and expenditures. Accordingly, the college has prepared for distribution to farmers at cost an account book that will satisfy all these requirements and at the same time pave the way for a study of costs of production of farm products. This work was interrupted by the war but has been resumed recently and is now being pushed with vigor.

WAYS OF SPREADING AGRICULTURAL SCIENCE

Prior to 1890 (in 1887) the federal government created the agricultural experiment stations. The job to which they were dedicated was to preserve and protect the nation's food supply. As a result of their labors, and those of the United States Department of Agriculture, discoveries are continually being made which are of untold value to farmers. To make these results available and of immediate practical use is the task assigned to the Agricultural Extension Service.

SUMMER MEETINGS AT EXPERIMENT STATIONS

The automobile has brought the experiment stations within a few hours' ride of almost every farmer of the state. This makes it easily possible for the farmer to visit his nearest station and see for himself the work in progress and its more striking results.

During the year, demonstration meetings were held at the main station at Madison, at the branch experiment stations at Marshfield, Spooner, Ashland and Hancock, and the county demonstration farms in Rusk and Douglas Counties. Not less than 6,000 people embraced the opportunity of joining these excursions and seeing experiment station workers in action and getting their results "first hand."



FIG. 29.—COMBINING BUSINESS AND PLEASURE

Above—Indian institute and “pow-wow” at Valley Junction.

Below—Institute at Lac du Flambeau attended by 375 Indian men, women and children.

FARMERS' SCHOOLS AND INSTITUTES

(E. L. Luther, In Charge)

Direct instruction by means of schools and institutes arranged by local people continues to be a convenient and popular means of getting experiment station results before farmers and their families.

During the year, 20 schools and 238 institutes were held, which were attended by nearly 90,000 people. One of the main difficulties in the past was to crystallize their teaching into action. This is now being rapidly overcome as is indicated

by the fact that limestone, fertilizer, soybeans, and the like were ordered by large numbers of farmers for immediate use.

TRAVELING SALESMEN OF EXPERIMENT STATION WORK

In addition to automobile excursions to experiment station farms and to farmers' schools and institutes, extension specialists in close touch with the work under progress at the stations are sent to all parts of the state to assist the farmers with their problems on their own farms. These men carry to the farmer on his own land the latest and best in agricultural thought and practice through meetings and demonstrations arranged by county agents.

RETAILING RESULTS OF EXPERIMENT STATION WORK

(J. F. Wojta, State Leader of County Agents)

The county agent is the local man on the job. He can be appealed to at a moment's notice as the farmers' local "service man." With the assistance of local farmers and experiment station specialists he plans demonstrations, arranges meetings, helps organizations and promotes agriculture generally in the numerous ways open to him.

During the year the number of these "local service men" has been increased to 50, the maximum permissible under the present law. That 12 of these men have been called to positions of greater responsibility and better pay in other fields during the year is a fine tribute to their ability. This competition with the commercial world, however, makes it difficult to secure and retain high-class men for these positions.

These men spend on the average 63 per cent of their time in the field working with groups and with individuals. The remainder is spent at the office preparing articles for local papers, conferring with farmers, writing letters and attending to office details.

During the year they have held an average of 45 meetings to the county, have made an average of 400 farm visits each, have each written 86 articles for local papers, and had office consultations with nearly 2,000 persons each.

The following tabulation is an index to the kind of work these men are doing:

Kind of work	No. of counties
Improvement of farm crops	50
Improvement of live stock	44
Soil management and drainage	37
Boys' and girls' club work	26
Potato improvement work	12
Fertilizer and lime demonstrations	6

FUNCTION OF AGRICULTURAL COLLEGE

To claim for the agricultural college and its experiment stations the entire credit for bringing about the remarkable improvement in the state's agriculture since 1890 would be presumptuous. All the state's educational agencies have combined with unseen—but no less powerful—economic forces in bringing about these results which are so often pointed out by others as peculiar to Wisconsin. In no small part these results have come from the unusual cooperative relationship found in this state between all organized agricultural activities.

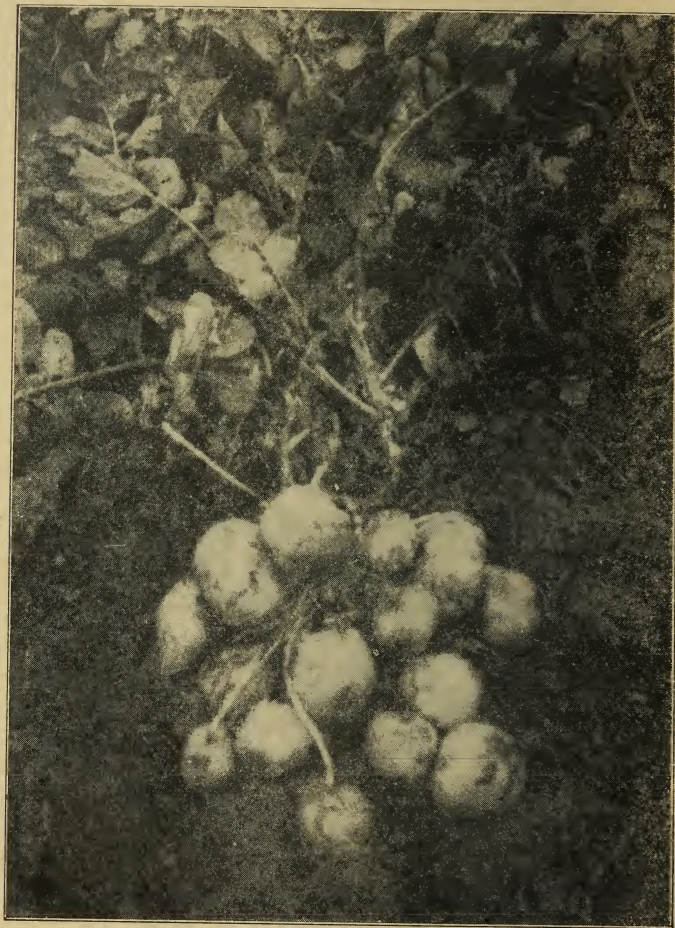
To deny that the experiment station laid the solid, scientific foundation upon which all this progress rests, and that the extension service was the chief agent in spreading this information among the farmers of the state, is equally futile.

Upon continued application of science to agriculture rests the future food and clothing supply of the world.

WISCONSIN COUNTY AGRICULTURAL AGENTS

January 1, 1921

County	Name	Address
Adams	E. V. Ryall	Friendship
Ashland	M. H. Wright	Ashland
Barron	W. A. Duffy	Barron
Bayfield	V. E. Brubaker	Washburn
Brown	J. N. Kavanaugh	Green Bay
Buffalo .....	.....	.....
Burnett	E. H. Thompson	Webster
Calumet	Royal Kiofanda	Chilton
Chippewa	P. D. Southworth	Chippewa Falls
Clark	H. M. Knipfel	Neillsville
Crawford .....	.....	.....
Dodge	A. A. Brown	Juneau
Door	E. G. Bailey	Sturgeon Bay
Douglas	J. M. Walz	Superior
Eau Claire .....	.....	.....
Florence	A. J. Lonsdorf	Florence
Forest	A. W. Schmutzer	Crandon
Grant .....	.....	.....
Green Lake	James Lacey	Green Lake
Iowa	H. R. Noble	Dodgeville
Jackson .....	.....	.....
Jefferson	J. M. Coyner	Jefferson
Juneau	W. J. Rogan	Mauston
Kenosha	B. F. Wood	Kenosha
La Crosse	W. E. Spreiter	Onalaska
Langlade .....	.....	.....
Lincoln	A. H. Cole	Merrill
Marathon	F. G. Swoboda	Wausau
Oconto	Robert Amundson	Oconto
Oneida	C. P. West	Rhineland
Ozaukee	Guy S. Hales	Port Washington
Pierce	H. G. Seyforth	Ellsworth
Portage	Warren W. Clark	Stevens Point
Polk	John S. Klinka	Balsam Lake
Price	H. J. Rahmlow	Phillips
Rock	R. T. Glasco	Janesville
Rusk	H. M. Jones	Ladysmith
St. Croix	A. W. Knott	Baldwin
Shawano	A. C. Murphy	Shawano
Sheboygan	C. F. Wehrwein	Plymouth
Taylor	R. A. Kolb	Medford
Vernon	Paul F. Graf	Viroqua
Vilas	Oscar Gunderson	Eagle River
Walworth	L. J. Merriam	Elkhorn
Washburn	R. H. Rasmussen	Spooner
Washington	Milton Button	West Bend
Waukesha .....	.....	.....
Waupaca	James Dance	Waupaca
Winnebago	G. A. Sell	Oshkosh
Wood	R. A. Peterson	Wisconsin Rapids



WATCH US GROW

The product of the skill and energy of Wisconsin farmers in growing pure bred, high producing, disease free, certified seed potatoes. Will these capture new markets for Wisconsin farmers?

Published and distributed under Act of Congress, May 8, 1914, by the Agricultural Extension Service of the College of Agriculture of the University of Wisconsin, K. L. Hatch, assistant director, the United States Department of Agriculture cooperating.

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THE VEGETABLE GARDEN



EXTENSION SERVICE OF THE
COLLEGE OF AGRICULTURE
THE UNIVERSITY OF WISCONSIN

DIGEST

Choose your garden site carefully. It is a waste of effort to garden in competition with shade and trees. Page 3

Plan the garden before planting. Hit or miss planting often results in wasted time, poor use of the soil, and lessened production. Pages 3-8

In many cases it is best to start the plants indoors for the small garden. Only a small amount of space is needed to start enough plants for the first crop of lettuce, early cabbage and tomatoes. Pages 8-12

The soil is a prime factor in a successful garden. Good drainage and "fine and loose" texture are essential. Pages 13-16

A practical planting equipment consists of a tape, garden line, hoe, rake, trowel, putty knife, and some small stakes to mark the end of the rows. A putty knife serves more purposes than any other garden tool. Pages 16-17

Test seed before planting so that you are sure it is good. Page 19

Tillage must be both thorough and timely. A shallow layer of soil, as nearly dust-like as practicable, should be over the surface of the garden at all times. Tillage done at the wrong time is often injurious instead of beneficial. Pages 22-23

Good tools are necessary for effective tillage. The most common error in choosing tools is the selection of too large implements. Much poor work is done because tools are not kept clean. Pages 23-27

Most garden pests can be controlled by simple measures applied at the right time. Garden sanitation, crop rotation and removal of weeds are preventive measures. It is important to know what the pest is and how to control it. See Table 11. Pages 27-31

Storing is the best way to preserve many vegetables for winter use. This method is cheaper, requires less work and often preserves more of the characteristic flavor of the vegetable. House cellars, outside cellars or caves and pits may be used for storage. Pages 31-36

Vegetable Gardens

J. G. MOORE

The home garden will pay abundantly for the time and care given it if the gardener directs his efforts wisely. Lack of success in gardening is most frequently due to neglect or to misdirected effort.

THE GARDEN SITE

It is a waste of effort to garden in competition with shade and trees. Hoeing, watering, and fertilizing cannot make up for lack of sunlight although many gardeners try to make them do so and fail. Good garden tracts may be spoiled by worthless, often self-planted trees and shrubs. Cut them out so that your vegetables do not have to compete for sunlight, food, and water. If the plants cannot be removed, or if buildings shade the plot for the greater part of the day, make arrangements for a suitable garden tract elsewhere. It is well to remember that although trees on the north side of the garden do not shade it yet their roots often extend far into the plot and take food and moisture from the soil, making it unprofitable to plant vegetables near the base of the trees.

THE GARDEN PLAN

What kind of house would the carpenter build without a plan? How would a garden, planned row by row while the planting was being done, compare with one carefully thought out in advance? Hit or miss planting usually results in wasted time, poor use of the soil and lessened production. The wise gardener will therefore plan his garden on paper in advance of the planting time.

How to Make the Plan:

Use heavy paper and ink so that the plan will stand a season's use in the garden.

A definite and fairly large scale is best to show the distances between rows. For the small garden $\frac{1}{4}$ or $\frac{1}{2}$ inch on the plan to every foot in the garden is convenient.

What the Plan Should Show:

Where each crop is to be.

The distances between rows.

If more than one crop is to occupy the same area during the season.

The approximate dates for the different plantings of lettuce, peas and other vegetables of which more than one planting is made.

IMPORTANT POINTS IN GARDEN PLANNING

1. Make every foot of land work all the time. When one crop is harvested another should take its place if there is room for its proper growth. Practically all of the garden should grow two crops and part of it ought to produce three. Warm season crops such as beans and tomatoes, and late seeded crops like turnips may follow early, cool season crops such as lettuce, spinach, radishes and onion sets.
2. Vegetables which can be stored for winter use should be given preference in the plan because they will be more appreciated when the supply is low and the price high.
3. First plan for the long season crops; the short season ones will take care of themselves. Grow short season crops (lettuce, radishes, spinach) between the rows of long season crops. Globe radishes may be grown in the rows of carrots, parsnips, and beets or between young cabbage and tomato plants or between hills of corn.
4. Crops requiring a large amount of space, such as potatoes, corn and vine crops, should usually be left out of the small garden. If these are grown, however, smaller, quick-growing crops should occupy the space until the larger crop needs it.
5. Foliage crops, such as lettuce and spinach, usually grow better in partial shade than do the fruit crops such as tomatoes and beans. Every crop, however, needs to have light at least part of the day.
6. Do not plant high-growing plants (corn, or tomatoes to be staked) where they will shade sun-loving plants. Shading can be decreased by having the rows run north and south.
7. Crops such as cauliflower, peppers, and egg-plant often fail because of weather conditions or slight errors in culture. Give their space to more certain crops or limit the area given them unless you are experienced.
8. In a small garden there is plenty of "up and down" space but it is limited sidewise. Tomatoes should be trained to trellises or stakes. Tall-growing peas, trellised and planted between rows of smaller vegetables, take no more space than do dwarf varieties and usually yield larger crops. Cucumbers may be grown on a trellis in the small garden.
9. Provide for as wide a variety of vegetables in your garden as practicable.
10. Leave enough space between rows to make good tillage possible. Slightly more space than is needed is better than too little, especially for the beginner.
11. The farm gardener should plan to use the horse cultivator. The long rows are better when the horse cultivator is used as it lessens the amount of turning necessary. When one does not want an entire row of a particular vegetable, two or more vegetables that require about the same space and time for their growth may be planted with advantage in the same row.

SPACE NEEDED FOR VARIOUS VEGETABLES

The distance between the rows will vary with the method of cultivation, the sizes of the variety and the fertility of the soil. The distances given below are for hand or wheel-hoe cultivation on average soil. These distances may in some cases need to be increased considerably when the horse cultivator is used.

Bean (bush)	15-18 inches	Onion	12-15 inches
Beet	15-18 "	Parsley	15-18 "
Cabbage (early)	18-24 "	Peas (double rows) .	8-12 "
Cabbage (late)	24-30 "	Parsnip	18-20 "
Celery (depends on method of blanch- ing)	30-48 "	Pepper	18-20 "
Carrot	15-18 "	Peas (single rows)..	24-30 "
Chard	18-24 "	Potato	30-36 "
Cress	12 "	Pumpkin	8-10 feet
Cucumber	4- 6 feet	Radish	9-12 inches
Corn (sweet)	30-36 inches	Rutabaga	18-24 "
Egg-plant	30-36 "	Spinach	12-15 "
Endive	15-18 "	Salsify	15-18 "
Kohlrabi	18-24 "	Squash (bush)	42-48 "
Lettuce	15-18 "	Squash (running)..	7- 9 feet
Muskmelon	5- 6 feet	Turnip	15-18 inches
		Tomatoes (staked) .	24-30 "
		Tomatoes (unstaked)	42-48 "

When vegetables of different kinds are planted in adjoining rows the distance between them should be approximately one-half the total distance allowed for the crops. If 4 feet is allowed between rows of celery when planted alone, and 2 feet for cabbage, when these vegetables occupy adjoining rows the distance between them should be 3 feet.

TIME CROPS OCCUPY LAND

The length of time between starting the crop in the garden and when it is ready for use, also the time it will occupy the land after being ready for use, are important things to consider in garden planning. Seasonal conditions and the variety used will affect the time required.

Table 1 shows the average time needed to grow different vegetables. In planning for crops to follow early vegetables, or which will occupy the space used by them, add to the time given in the table the probable length of time to use the crop or for it to become unfit for use.

The dates given are the approximate ones of planting at Madison. In the central part of the state the dates would be from 10 to 12 days later, and for northern Wisconsin 18 to 20 days later.

In the table which follows, * placed before the name of a crop indicates that other plantings may be made; ** indicates that the crop occupies the land until the end of the season. In case of *** other plantings may be made as the crop is used, but the winter crop occu-

pies the land until the end of the season. Early cabbage will occupy the land until August 15 or later.

TABLE I.—AVERAGE TIME NEEDED TO GROW VEGETABLES

Crop	Approximate date of planting at Madison	Ready for use (Weeks)
*Bean (bush) snap	May 10-15.....	7 to 8
**Bean (bush) dry	May 10-15.....	
**Bean (pole)	May 10-15.....	8 to 9
***Beet (early)	April 15-20.....	8 to 9
***Beet (late)	May 15-June 1.....	
Cabbage (early plants)	April 25-30.....	12 to 13
**Cabbage (late plants)	June 25.....	
***Carrot	April 15-20.....	9 to 11
**Celery (plants)	June 20.....	8 to 10
*Corn (early)	May 5-10.....	9 to 10
**Corn (late)	May 15-June 10.....	
Cress	April 15-20.....	4 to 5
**Cucumber	May 15-20.....	
**Egg plant	June 5-10.....	
***Kohlrabi	April 20-25.....	9 to 10
*Lettuce (seed)	April 15-20.....	6 to 8
*Lettuce (plants)	April 20.....	4 to 6
**Muskmelon	June 1 (set out plants started under glass)	
**Onion (seed)	April 15-20.....	
**Onion (sets)	April 15-20.....	8 to 10
*Parsley	April 15-20.....	12 to 14
**Parsnip	April 15-20.....	
*Pea	April 15-20.....	8 to 10
**Pepper	June 5-10.....	
Potato (early)	May 1-5.....	10 to 12
**Potato (late)	June 1-10.....	
**Pumpkin	May 15-20.....	
*Radish	April 15-20.....	4 to 6
**Radish (winter)	July 15.....	
**Rutabaga	July 1.....	
**Salsify	April 15-20.....	
*Spinach	April 10-15.....	4 to 6
**Squash (bush)	May 15-20.....	
**Squash (runner)	May 15-20.....	
**Tomato (plants)	May 15-20.....	
Turnip (spring)	April 15-20.....	8 to 10
**Turnip (late)	July 20.....	

VARIETIES TO GROW

Tastes differ greatly in choosing varieties of vegetables. The following list will doubtless prove satisfactory.

Bean, bush (green pod)—Bountiful, Stringless Green Pod, Refugee; (wax pod)—Improved Golden Wax, Pencil Pod Wax.

Bean, pole (green pod)—Kentucky Wonder; (wax pod)—Kentucky Wonder Wax, Golden Cluster Wax.

Beet, (early)—Crosby's Egyptian, Edmand's Early; (late)—Detroit Dark Red, New Century.

Cabbage, (early)—Early Jersey Wakefield, Copenhagen Market; (mid-season)—Succession, Surehead, Allhead, Flat Dutch; (late)—Danish Ballhead or Hollander.

Copenhagen Market is slightly later, but has better heads than Wakefield. Hollander requires very good conditions to make heads. Mid-season varieties planted slightly later will often give better results for winter cabbage.

Carrot—Chantenay, Oxheart for heavy soils.

Cauliflower (an uncertain crop)—Dry Weather, Early Snowball.

Celery—Golden Self Blanching, White Plume; (late)—Winter Queen, Emperor, Giant Pascal.

Chard—Lucullus.

Cucumber—Improved White Spine, Improved Long Green.

Eggplant (one of the more difficult crops to grow successfully)—Black Beauty.

Kohl-Rabi—White Vienna.

Lettuce (leaf)—Black Seeded Simpson, Grand Rapids; (head)—May King, Big Boston, Salamander, Wayahead, Bronze leaved head, Bronze head.

Muskmelon—Emerald Gem, Milwaukee Market.

Onion (sets)—Yellow or White; (seed)—Yellow Globe Danvers, Ohio Yellow Globe, Southport Red Globe, Southport White Globe.

Parsnip—Improved Hollow Crown, Guernsey.

Peas (dwarf, early)—Little Marvel, Laxtonian. (May be planted in succession); (dwarf, late)—Stratagem; (tall, early)—Alaska; , (tall, late)—Dwarf Champion, Telephone.

Pepper (sweet)—Ruby King, Neapolitan, Sweet Meat Glory, Sweet Upright; (hot)—Red Chili, Red Cayenne.

Pumpkin—Small Sugar, Quaker Pie, Japanese Pie.

Radish (early)—Early Scarlet Globe, Early Scarlet Turnip, Crimson Giant, White Icicle; (summer)—White Strasburg; (winter)—Chinese Rose, Black Spanish.

Salsify—Sandwich Island.

Rutabaga—American Purple Top.

Squash (summer)—Fordhook, Crookneck, Pattypan; (winter)—Hubbard, Delicious, Delicata.

Sweet Corn—Golden Bantam (plant in succession), Bantam Evergreen. (late)—Stowell's Evergreen.

Tomatoes (early)—Earliana, Bonny Best, Chalk's Early Jewell, Red Head, Perfection, John Baer; (late)—Stone, Livingston Globe.

Turnip (early)—Early White Milan; (main crop)—Purple Top White Globe, Yellow Globe.

Order seed early and buy only from reliable seedsmen. The best is cheapest in the end even though you have to pay more for it.

EARLY PLANTS

It is possible to have a garden without starting part of it indoors, but it is usually more expensive or less satisfactory.

If you are sure you are going to be able to buy good plants of the kinds you want, and when you want them, then it may be best to let someone else grow them. But be sure you won't be disappointed. Although it takes some work and space to grow good plants for producing early vegetables, the difficulties of growing them are often greatly magnified.

Lettuce, chard, cabbage, and kohl-rabi can be easily matured if planted in the garden after conditions have become favorable for their growth but they may be had much earlier if started indoors or under glass. It is almost essential to start tomatoes, peppers, egg plant, and celery in this way if their production is to be worth while.

WAYS OF GROWING EARLY VEGETABLES

Hotbeds, cold-frames, and window-boxes are commonly used for starting plants to be set in the garden.

Because it is difficult to get the proper material for heating the hot-bed and because of the care needed to operate it successfully, it is of questionable value to the man with a small garden or to the beginner.

Many gardeners find the cold-frame—which is merely a box or frame covered with glass, having the south side somewhat lower than the north—more satisfactory. While plants cannot be had quite so early as when grown in the hot-bed, the cold-frame needs less attention and offers less danger of injury to the plants because of changing temperatures. It can be inexpensively made by using storm sash. Such plants as lettuce and radishes may be grown to maturity in it in addition to the plants for setting-out. If the seed is sown indoors and the seedlings transplanted to the cold frame, the crop will be very little later than when started in the hotbed.

With the small garden it is best to start the plants indoors. Only a small amount of space is needed to start enough plants for the first crop of lettuce, early cabbage, and tomatoes.

Good soil desirable. When good soil has not been secured the previous fall, the problem of securing it may be troublesome. If it cannot be had from a greenhouse, resort to the garden. Clear the snow off a small area to encourage thawing and get the soil some warm day in early March. If the soil is still frozen, let it thaw indoors. Get a little sand if possible to mix with it and to serve as a top layer in the seed box. Before starting the seed box, let the soil warm up and dry until it does not pack in a hard lump when squeezed in the hand.

Shallow seed box. A shallow seed box is best. Suitable ones can usually be had at grocery stores. Cigar boxes $2\frac{1}{2}$ or $2\frac{1}{4}$ inches deep may be used but somewhat deeper boxes are better. Three or four boxes will be enough in which to start all the lettuce, cabbage, and tomato plants used in the average garden. If the box has a tight bottom, make a few holes in it to provide drainage.

How to fill seed box. Slightly more than enough soil to fill the box should be put in loosely and the surplus scraped off with a stick. This will leave the top smooth and level. Then press the soil down with a small piece of board being careful to leave the surface level. After it is pressed down, the top of the soil should be from $\frac{1}{4}$ to $\frac{1}{2}$ inch below the top of the box. A better stand of plants will usually result if the last $\frac{1}{2}$ inch of soil put into the box before pressing it down is sand. The seed should be sown in this layer of sand and close to the soil beneath.

Sowing the seed. Make a shallow trench about $\frac{1}{4}$ of an inch deep crosswise of the box with the finger or a dull pointed stick. Scatter the seeds in the trench using either the packet or the thumb and forefinger. Sometimes a trench marker (Fig. 1) is used.



FIG. 1.—READY FOR STARTING PLANTS INDOORS

Pot labels, trench marker and soil firmer are a part of the equipment as well as pans, seed and fire shovel.

The thickness of sowing the seed depends largely on how much of it is likely to germinate. If seeds are sown too thickly there is then more danger of the young plants rotting off. On the other hand, seeding should be thick enough to give a good stand. Press the seeds gently into the soil and cover them with a thin layer of it. If the plants are too thick they should be thinned soon after they come above the surface. The distance between the rows will depend somewhat on how long the plants are to be left before transplanting. Distances from $1\frac{1}{4}$ to 2 inches are usual and convenient.

Watering the seeds. Water the seed box well after sowing, being careful not to wash the seed, particularly if different varieties have been sown in the same box. Enough water should be put on to moisten

the whole body of soil in the box but not enough to cause it to become muddy.

One of the objections often raised to growing early plants indoors is the damage to furniture and rugs from watering. This can be overcome by setting the seed boxes in the sink or some other receptacle until all excess water has drained off. Then if the boxes are set on oilcloth or heavy paper no damage should occur.

Next put a pane of glass or other cover over the seed box to prevent loss of moisture, and set the box in a warm place. As soon as the young plants break the soil, remove the cover. If it is left on, the plants will have a tendency to become spindly or "leggy," and are likely to rot off.

Care of young plants. Young plants need careful attention with regard to proper light, heat, and water. Keep the seed box where it will get abundant light, otherwise spindly plants will result. It is better to have the temperature somewhat low rather than too high for excessive heat means soft, spongy plants which are less likely to grow well when set out.

How to water plants. Watering plants improperly causes more failures than any other thing. Plants may be either choked or drowned. One is as bad as the other.

Choking is likely to occur when small amounts of water are put on at rather frequent intervals. There is not enough water to moisten the bottom soil and the top is kept too wet, which encourages disease.

Drowning is less frequent, especially if the seed box has drainage openings. Water applied often and in large quantities excludes the air from the soil so that the plants smother.

The best way to water plants is to put on enough water to moisten all the soil in the box and then wait until the surface begins to appear lighter in color before making another application.

Damping off. Young plants that seem to be in good condition sometimes begin to die in spots. The disease usually causing this condition is called "damping off" and unless it is checked all the plants may be killed.

This disease is usually present in soil used in seed boxes unless it has been sterilized. It becomes active when the temperature is high and there is a large amount of moisture in the air around the plants or on the surface of the soil of the seed box. Proper watering, of course, will reduce the danger from "damping off."

The disease should be checked as soon as it appears. Affected plants that have fallen over should be removed but care must be taken not to spread the disease. The next thing is to get rid of the excess moisture by setting the plants in the sunlight and allowing the soil to become quite dry. One of the chief reasons for using sand in the top layer of the seed box is that it dries off readily so that there is less danger from "damping off." Another way to dry the surface is to sprinkle dry sand over it. Plants should be thinned out if they are so thick that there is little circulation of air between them. Another method of control is to spray the plants with potassium sulfide solution—1 to 2 ounces of sulfide

to 1 gallon of water—but this is usually not necessary if other methods of control are promptly used.

Seedlings need room. The young plants soon begin to crowd one another and will become long-stemmed or “leggy” unless they are given more room, either by being thinned out or transplanted. The latter is more common.

Four boxes for transplanting, one for tomatoes, peppers and egg plant (if either of the latter are grown), one for lettuce, one for cabbage and cauliflower, and one for celery, will meet the needs of the average gardener. A box 12 inches square will hold 36 plants set 2 inches by 2 inches, or 64 when planted $1\frac{1}{2}$ inches by $1\frac{1}{2}$ inches. Celery plants may be set 1 inch apart; lettuce, cabbage and cauliflower $1\frac{1}{2}$ inch apart; and tomatoes, egg plants and peppers 2 inches. In transplanting, be sure to get the roots of the plant in firm contact with the soil.



FIG. 2.—TRANSPLANTING SEEDLINGS TO FLAT

Young plants become long stemmed or “leggy” unless they are given sufficient room.

The same general care should be given after transplanting as when the plants were in the seed box. For two or three days after setting the plants out it is well not to give them so high a temperature nor such strong light as before.

Hardening-off. Many persons have success in growing plants indoors but lose a large portion in setting them into the garden. A common cause of this is subjecting the plant suddenly to too great a change. Plants require time to adjust themselves to new conditions and therefore should be accustomed to the conditions of the garden gradually by the process known as “hardening-off.” Begin to get the plants ready for the change ten days or two weeks before setting them out in the garden. Start by setting the box out in the sun at noon for a few minutes and repeat this daily when the weather is favorable until the plants can be left out continuously. Transplanting will be more successful when this is done than when a sudden change is made.

Flower pots are often used when unusually large plants are wanted for setting out, or for starting vegetables that are difficult to transplant such as cucumbers and melons. Unless the gardener has a hot bed or cold-frame or desires only a small number of plants, this method is not practicable because of the space required.

Instead of setting the plant from the seed box into a larger box it is put into a small flower-pot. There it may remain until planted in the field or it may be moved to a larger pot. Various substitutes for pots



FIG. 3.—DIRT BANDS AND FLOWER POT FOR TRANSPLANTING

Tomato plant in dirt band; larger tomato plant in flower pot; cucumber plant in dirt band.

are the dirt band, the bottomless strawberry box, or a tin can with the bottom removed and the side slit, so that it may be readily removed from around the plant. The dirt band or strawberry box is better than the can for this purpose.

Plants started indoors may be transferred to a cold frame as soon as they begin to crowd in the seed box. In the cold frame they can usually be given slightly more room than that suggested when transferred to boxes. The same care should be given the plants in the cold frame as in the box except that they must be protected against low temperatures and given ventilation on bright, warm days. Ventilation may be had by raising the upper end of the sash slightly or by sliding adjoining sash in opposite directions.

THE GARDEN SOIL

The soil is a prime factor in a successful garden. In the city garden usually little choice is possible, therefore the city gardener must make the soil as suitable as he can. The farm gardener has more choice, but not infrequently somewhat unsuitable soil will have to be used in order to locate the garden conveniently. If the soil is very unfavorable it may require more than one year to get it into good condition, but proper practices will accomplish much in a single season.

Good drainage essential. Vegetables cannot thrive in water-logged soil. If it does not have natural drainage, provision must be made to drain it. Excessive surface water may be carried off by surface ditches. If made as soon as the frost is out of the ground, they will help in getting the soil in condition to work earlier. Lightening with sand or coal ashes will help heavy soil which is inclined to hold too much water. On such soils tile drainage is usually best. When only low marshy lands are available, gardening on raised beds is often satisfactory.

Have soil fine and loose. The desired texture of a garden soil is often described as "fine and loose." "Loose" does not mean that the soil particles are far apart, but that they are not cemented into large masses or "clods." If a soil is lumpy and cannot be made "fine" by tillage methods, it should be modified. On some soils this may be done by increasing the organic content of the soil, or by adding lime, while sanding or using coal ashes may be necessary on others.

How to apply modifiers. The common method of increasing the organic content of the soil is by putting on manure, preferably well-rotted manure, and thoroughly mixing it into the soil. Rotted lawn clippings, rotted leaves, or even muck may be substituted for manure as a means of adding organic matter. Ten to twelve pounds of stone lime per square rod, put in small piles, covered with moist soil until it slacks, and then distributed and worked into the soil helps to loosen heavy clays.

Sand or sifted coal ashes make excellent modifying material for heavy soils. Put on enough to give the desired texture. Wood ashes, or coal ashes which contain wood ashes, should not be used for this purpose unless the amount necessary is small.

Plant food. When the garden is cropped to its fullest capacity the demands upon the plant food are large. Most garden soils, unless they have been cropped for some time, are capable of producing fairly satisfactory crops without applying plant food if they are properly prepared and then properly tilled during the growing season. Better results may be expected, however, if there is an abundance of plant food present. There is little danger of getting the garden soil too fertile.

Well rotted manure if available is probably as good a garden fertilizer as can be secured. If fresh manures must be used they should preferably be incorporated into the soil in the fall. It is not advisable to use substitutes for manure if possible to obtain it as it not only adds plant food but organic matter as well.

Commercial fertilizers as substitutes. Commercial fertilizers may be used as substitutes for manures but they are less satisfactory and often cause injury.

Nitrate of soda is most often used, although it is the commercial fertilizer most likely to produce injurious results. Precautions in its use are: Don't apply too heavily ($\frac{3}{4}$ to $1\frac{1}{2}$ lbs. per sq. rod is enough); do not leave it on the foliage; if using a large amount, apply it in at least two lots. Chicken manure, although a good garden fertilizer, causes injury if applied in large amounts. On some soil phosphorous-carrying fertilizer may be needed. Acid phosphate, 2 to $2\frac{1}{2}$ pounds per square rod, should be sufficient on most soils.

Organic matter. The most troublesome soil problem which the city gardener has to face is keeping up the organic matter. Remember that although a soil may contain an abundance of plant food, it will not produce good crops unless it also contains a goodly supply of decaying organic matter. The texture of the soil and its ability to hold water are also greatly improved by organic matter. The methods of supplying it are suggested under "How to Apply Modifiers."

PREPARING THE SOIL

The first thing to consider when preparing the soil is whether it is desirable to increase fertility, to add organic matter, or to modify the soil. If any of these are to be accomplished the material should usually be put on before tillage begins, except in the case of chemical fertilizers. The material should be spread evenly and, if coarse, be well broken up.

The actual preparation begins with spading or plowing. "Keep off the soil when it is wet" is advice which the gardener must follow if he is to avoid trouble later on. This is especially true if the soil is one of the heavier types. Time seemingly wasted in waiting for the soil to become fit for tillage is time well spent. There is no hard and fast rule as to when soil is dry enough to work. This simple test is about as reliable as any: Squeeze a handful of freshly turned soil in your hand. If upon releasing it, the lump crumbles readily with little pressure or disturbance it is fit to work.

Plow or spade deep unless you are turning up a soil of a different color from the surface soil. This is the sub-soil and is not suited to the growth of plants. An inch or two of subsoil turned on top and thoroughly mixed with the surface soil will do little harm, and by repeating this a few years a shallow garden soil may be changed to a deep soil which is highly desirable.

How to plow. Good plowing demands that all the soil be turned and that the corrective material or refuse on the surface be well turned under. Too many plowmen "cut and cover" because, being in too great a hurry to finish the job, they try to turn a wider furrow than is possible with the plow. The result is that only a portion of the soil is turned, holes are left between the furrows, and it is practically impossible to put the garden soil into the desired condition by later tillage. Unless you secure an experienced and thoroughly reliable plowman, it

is well to be on hand when the plowing is done to see that the "cut and cover" method is not used. Plow deep, but not too deep. Remember that subsoil will not produce good crops.

Harrowing. Much time and hard labor will be saved by harrowing after plowing. If the garden tract has been in sod or if the soil

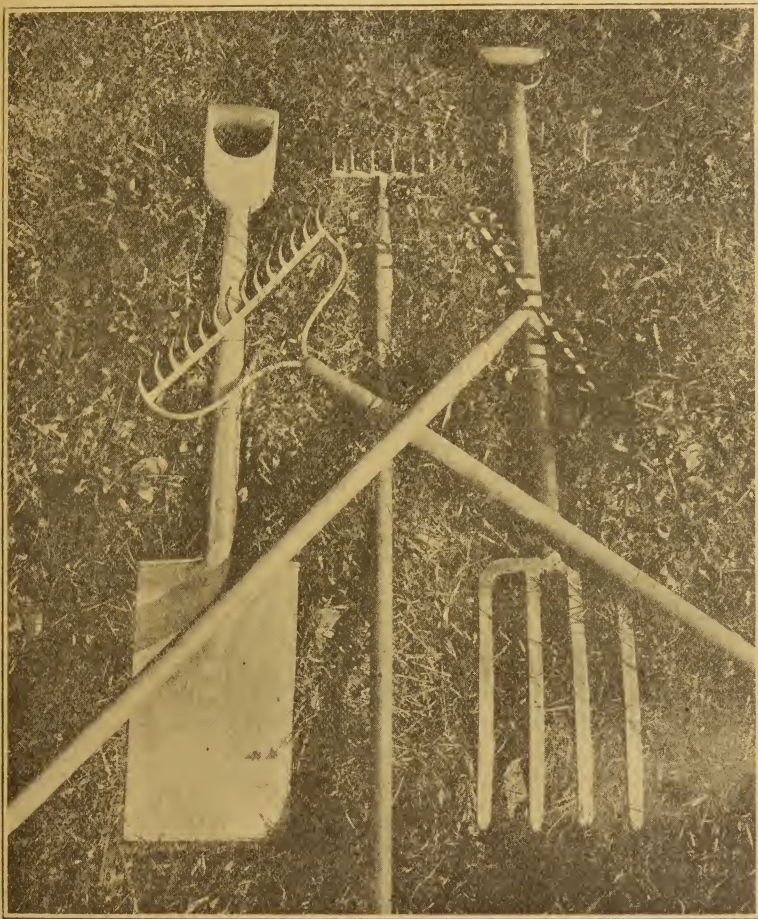


FIG. 4.—TOOLS FOR PREPARING THE SOIL
Spade, spading fork, broad rakes and narrow rake.

is lumpy, harrowing is practically necessary. Under such conditions discing will be very beneficial, especially on sod. The discing or harrowing should leave the soil comparatively level and with no large lumps. This may necessitate going over the tract several times.

How to spade. Good spading is an art. A spading fork is much better than an ordinary spade for this work. Start at a corner of the

tract to be spaded. With the back toward the area to be spaded insert the fork the entire length of the tines into the soil, if possible. Lift out the forkful, and throw it on the farther side of the hole made in removing it, inverting it at the same time. Move sideways the width of the fork and repeat the operation. When the other side of the tract has been reached, step back and work back toward the starting point. This time the soil is thrown into the opening previously made.

Pulverize the soil as you spade by striking the inverted forkful with the tines of the fork. Work the manure or corrective material in thoroughly. Care should be taken to cover any coarse material so that it will not be pulled to the surface in raking. The thickness of the forkfuls taken will depend largely upon the type of soil. In light or friable soils it is limited only by the amount that can be turned quickly and easily. In heavier soils which tend to be lumpy, smaller forkfuls will be more easily handled and the soil can be broken up better.

Raking. The object in raking is to level and pulverize the soil. It should follow spading immediately, in fact, if there is much spading to do, it will be found advantageous to spade for a time and then rake the spaded area. The soil works down better when freshly turned. If it be allowed to become dry it is much more difficult to break up the lumpy portions. If the soil has been left very uneven by the spading, time and work will be saved by using the hoe or spade to do the rougher leveling, and the rake for the finer work. Some gardeners rake off all the lumps that do not readily break down, but this should not be done. If they interfere with seeding, rake them off the row strip and leave them until after a rain, then they can easily be broken down. This operation can often be hastened by moistening the soil somewhat in the evening and raking the following morning before the clods dry out again.

Time spent in putting the soil in the best possible condition before planting is well spent, for soil cannot be put in as good condition after the seeds and plants are in the ground. Occasionally, it may even be advisable to spade the soil a second time in order to secure better condition before planting. Spade all the garden as soon as possible whether it is to be used at once or not. While it will require some additional work to keep it in condition, the soil moisture—which is likely to be badly needed later on—is conserved and numerous weeds are destroyed. Then too there is a greater tendency to use the soil more if it has been prepared for planting.

SOWING THE SEED AND SETTING PLANTS

When the soil is fine, loose, and level, it is ready to receive the seeds and plants. It should also be free from sticks, stones, and clods, in fact, be in perfect tilth. For accurate work there should be two permanent stakes at each end of the garden and all measurements should be made from these. Shingle nails driven into the tops of these stakes are convenient for holding one end of the tape.

The planting equipment consists of a tape, garden line, hoe, rake, trowel and some small stakes to mark the end of the rows. The tape should be long enough to reach at least half the length of the garden. The hoe should preferably be a three-cornered one, with the shank of the handle attached at one corner. A strong garden trowel will be more satisfactory in the end than one of the cheap kind. The line may be anything from a piece of wrapping twine to one of the expensive ones offered by seed stores. A ball of seine twine is a good investment as it makes good lines; and one will find by experience that it is a saving of time as well as a convenience to have two or three lines available. The stakes to which the line is attached should be about 18 inches long, strong, and well sharpened.

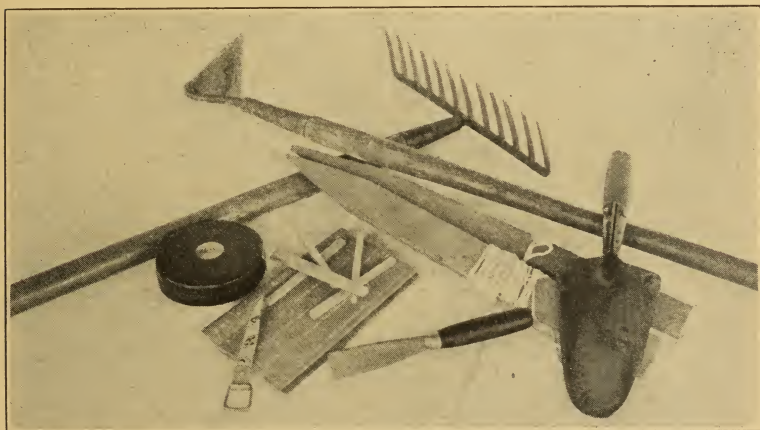


FIG. 5.—PRACTICAL PLANTING EQUIPMENT

The putty knife has more uses than any other garden tool. It is an efficient dibber, plant lifter, tool cleaner, crop harvester and shoe cleaner combined.

Seed. Only fresh, viable seed should be used. Old and doubtful seed should be tested. Count out 50 or 100 seeds and plant them in a shallow box filled with sand. If at least 75 per cent of the seed germinates quickly and sends up strong, vigorous sprouts, it is satisfactory. Parsnip, parsley, and celery seed which germinates 60 per cent is satisfactory.

Don't plant too early. Garden seeds germinate best at about the same temperature at which the plants make their best growth. It is useless to plant seeds of warm season crops before the soil warms up. The germination will be poor, the seedlings weak, and the plants will be stunted, resulting in a poor crop. Best results are secured when the seeds germinate readily and when the plant grows vigorously and this can only occur when a desirable soil and air temperature has been reached.

Preparing the seed bed. Most of the planting will not immediately follow harrowing or raking, therefore the row strip will usually

need further preparation before planting. The hoe or Norcross type of cultivator loosens the soil very well. Then if the rake is used to level and fine it, an ideal bed for the seed will be secured.

Making the trench. Most vegetables are grown in "drills." These are solid rows as opposed to "hills" which are groups of plants growing close together with considerable space between groups.

Always use a line to get the rows straight. Even when a line is used, the rows may be crooked unless care is taken with regard to the following:

Set the stakes so the line will be tight. A line set this way, if pushed from the proper place, will snap back into position when released but a loose line will not. Have the line close to the ground; on the ground is better than two inches above. If the row is long, a stake in the center will help keep the line in place.

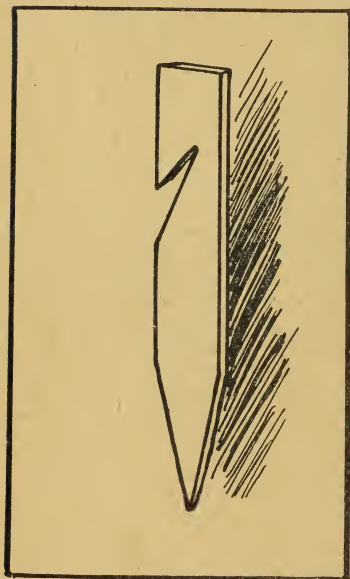


FIG. 6.—NOTCHED STAKES AID IN MAKING STRAIGHT ROWS

Set stakes so that the lines will be tight. If the row is long a stake in the center will help keep the line in place.

A stake with a notch in one side (Fig. 6) is very convenient for this purpose. Another method is to use a small, preferably round, stick sharpened at one end. Indicate near the center of the line a point over which the line passes. Then twist the line around the stick 3 or 4 inches from the sharp end without removing the stakes and set the stick at the point marked on the ground so the line when free passes over that point.

Don't crowd the line when making the trench for seed or when setting plants. Some gardeners prefer to set the line an inch or two to one side of the place where the trench is to be made or the plants set. This is more often done in setting plants than in sowing seed. The garden line gives less trouble when this is done but it is harder to get straight rows.

The depth of the trench depends upon the desired depth of planting. The all-important thing is to plant the seed sufficiently deep so that it will get enough moisture to saturate it, otherwise it will fail to grow. No definite depth of planting can be given for any seed as it will vary with the moisture in the soil, the size of the seed and the fineness of the soil particles. Dry soil, large seed, and coarse soil require deeper planting than moist soil, small seed or fine soil.

As a rule it is not advisable to plant seed deeper than necessary to get enough moisture for germination, as with most seed deep planting decreases the possibility of the seed growing or retards its growth. There

should be certainty, however, on the part of the gardener that the seed is deep enough. If there is fear that the plants will not be able to push their way out of the soil either use more seed or improve the tilth.

Trenches for plants commonly grown in drills—except peas and corn and possibly at times beans—are best and most conveniently made with the end of the hoe or rake handle. If the motion used is similar to that made in sweeping, a trench which is straight and of uniform depth can be easily and quickly made.

For the deeper trenches the corner of the hoe is preferable. A three-cornered hoe (Fig. 9) is best for this purpose. In making the trench, stand close to the line and remove the soil by using the hoe somewhat as a plow, except instead of pulling the hoe through the soil in a continuous motion use a series of forward and backward motions. While somewhat difficult at first one is soon able to get a more uniform and straighter trench than by a continuous forward movement of the hoe. It should be remembered that straight trenches of uniform depth are only possible when the soil has been properly prepared before making the trench.

Thickness of seeding. The thickness of sowing seed varies with different conditions. It is important to be sure of a good stand of plants. At the same time it is desirable not to sow thicker than necessary, for surplus plants means wasted seed and increased labor in thinning.

It is very important to know before sowing what proportion of the seed is likely to grow. One cannot tell this by looking at the seed, so it is advisable to test seed before using it for seeding. The test should be made quite a while before time for sowing so that if it proves to be inferior a new supply can be obtained.

A good way to test seed is to plant it in a box similar to the ones used for starting early plants. Use 25 or 50 seeds of the larger kinds



FIG. 7.—USING THE HOE HANDLE TO MAKE TRENCHES

A straight trench of uniform depth can be quickly and easily made if the motion used is similar to that in sweeping.

and 100 of the small ones. This is enough for a reliable test and makes it easy to figure out the percentage of germination.

Another method of testing seeds is to put them on a plate between moist cloths or blotters. A piece of glass or another plate should be placed over the first to keep in the moisture. The tests do not necessarily show how many seeds will grow when sown out of doors; they merely indicate what proportion of the seeds have the ability to grow if conditions are favorable. Usually the number developing plants out-of-doors is less than those which grow indoors.



FIG. 8.—MAKING DEEPER TRENCHES WITH CORNER OF HOE

A three-cornered hoe used somewhat like a plow gives good results.

Sowing the seed. The seed drill wastes the gardener's time unless considerable amounts of the same kind of seed are to be sown. In the small or medium-sized home garden the seed is best distributed by hand. Two methods are in common use for sowing small seeds. One is to sow directly from the packet. This is done by shaking it gently. It takes some time to learn how to distribute the seed evenly by this method but when once learned it is very satisfactory. The other common method is to grasp the seed between the thumb and the first two fingers. Even distribution is secured by gradually advancing the thumb over the fingers, which rolls the seed out of the sower's hand. Usually a quantity of seed is poured in the left hand and taken in the right hand as needed. Large seeds are sown in the same manner except that they are dropped in the proper number at the desired place instead of being rolled from the hand.

Covering seed. Proper covering of seed is one of the most important operations of garden making. The more unfavorable the conditions the greater the necessity of doing the work well. The first requisite for proper covering is a fine soil so it is essential that the preparation tillage be well done. As previously stated the depth of planting should insure enough moisture for germination. Proper covering directly affects the ability of the seed to absorb this moisture. It is only done efficiently and readily when a large portion of the exterior of the seed touches the soil particles. Thus, fine soil firmly pressed around the seed encourages rapid germination, which is highly desirable, if best results are to be obtained. The usual method of securing this contact is to pat the soil with the hoe, step on the hill, walk on the row or on a board laid over the row, after planting. All of these methods secure the desired result so far as supplying the seed with moisture is concerned, but they also give the conditions best adapted to the drying out of the soil around the seeds and young plants. A better method which requires little or no more time is to partly cover the seed, press the soil firmly over it, and then put a layer of fine, loose soil over the compacted soil. At first this might appear to be additional work and to require more time. However, by pushing the loose soil from the side of the trench nearest him, with the back of the hoe blade into the trench and pressing it down at the same operation and then pulling the soil for the loose layer from the opposite side of the trench one soon becomes able to cover the seed nearly as quickly and more efficiently than by the other method.

Marking the row. It is desirable to mark both ends of every row in which seeds are sown. Frequently conditions arise which make cultivation desirable before the plants appear. When the ends of the rows are marked it is very easy to stretch the garden line along it and cultivate without fear of molesting the germinating seed. Unless the marker is to be used to carry information about the planting, a twig or a short piece of stick is a suitable marker.

Thinning. To insure a stand and to enable weak seedlings to push out of the ground it is necessary to sow seed thickly and to thin the young plants afterward. Failure to thin plants results in reduced production and at times in vegetables which do not reach sufficient size for use. Practically all the small seeded vegetables will need more or less thinning when sown in rows. The distances to be left between plants vary with the vegetable, the variety, and the condition of growth. The following distances are suggestive:

Beans	4-6 inches	Parsnips	4-6 inches
Beets (early)	2-3 "	Peas	1.5-2 "
Beets (late)	5-6 "	Radish	
Carrots (early)	1-3 "	(turnip-shaped)....	1-2 "
Carrots (late)	4-5 "	Rutabagas	6-8 "
Chard	8-12 "	Salsify	4-5 "
Lettuce (leaf)	4-10 "	Spinach	4-6 "
Lettuce (head)	6-15 "	Sweet Corn (drills) .	8-12 "
Onions	1-3 "	Turnips	3-6 "

It is best to thin deep-rooted crops like parsnips and salsify when the plants are quite small. A good time to thin plants is as soon after a heavy rain as the soil will permit. Delayed thinning of any crop means that the remaining plants are disturbed and checked more than when the thinning is done while the plants are small.

With beets, onions, turnips, and some other crops it is not advisable to thin to the full distance at the first thinning. Thinning to about one-half the distance allows the young plants to develop so that they may be used as greens or green onions or when partly mature thus materially increasing the product from the garden.

TILLAGE

Good results demand careful attention to the soil conditions during the summer. Three things are necessary: (1) weeds must be prevented from competing seriously with the vegetables for food and moisture or from excluding light from the low growing plants. (2) a constant and sufficient supply of moisture must be maintained and (3) the soil must be kept in such condition that the food locked up in its particles may become available for use by the plants. Tillage is of first importance in attaining these objects.

Tillage must be thorough and timely for satisfactory results. Many gardens which give promise of large production during the early part of the season turn out to be failures because tillage is neglected.

Thorough tillage is that which keeps a shallow layer of dust-like soil over the surface of the garden at all times. Such tillage not only catches and holds moisture and helps to make plant food available, but in most cases controls the weeds.

To get best results:

1. Till immediately *before* sowing or planting the areas to be planted.
2. Till immediately *after* planting the ground compacted in the planting operations.
3. Till the entire garden at least *once a week* if soil conditions permit. This may be reduced when plants occupy the space between the rows.

4. Till after each rain that is heavy enough to destroy the soil mulch.

Tillage should be shallow so as not to destroy the roots of shallow-rooting plants. A layer of loose soil 1 to 2 inches deep is an efficient conserver of soil moisture, therefore there is no need for deep tillage.

Tillage must be not only thorough but timely as well. Tillage done at the wrong time is frequently injurious instead of beneficial. The first thing that the gardener on heavy soils must learn is to "make haste slowly" after rains. Working a heavy soil when it is too wet causes the particles to cement together in clods and these necessitate a great amount of labor if the proper physical condition of the soil is to be restored. Tillage of clay soil when it is too moist may result in conditions which require two or three seasons to remedy.

On the other hand, tillage should not be delayed so long after rains that the soil bakes, as this is equally unfavorable. It is necessary,

therefore, for the gardener to watch the soil after rains heavy enough to pack the soil, and to till the entire garden as soon as the soil is in condition for it.

There is no infallible test for determining when a soil is ready for tillage. A simple method is: Squeeze a handful of soil; if upon opening the hand the soil crumbles readily when slightly disturbed, then it is safe to till. If it cements and sticks together, or becomes slightly muddy on the outside, it is too wet.

Weeds should be destroyed just after the seeds germinate. Tillage at intervals of a few days before planting makes weed control after planting much easier. The weed seed, having been in the soil before the vegetable seed is sown, is likely to germinate before the vegetable seed, and thus the weeds get the start of the young vegetables. This often makes it difficult to control the weeds along the rows of parsnips or other slowly germinating plants. Stretching the garden line over the row and cultivating just as though the vegetables were up will eliminate most of this trouble.

Tillage tools. Effective tillage demands good tools properly used and well cared for. The best garden tool in the hands of a gardener who does not know how to use it will not produce good results. The three chief considerations in choosing garden tools are efficiency, speed, and ease of operation. The best tool is the one which fulfills these requirements. Too many gardeners use only their hands in operating garden tools. Better results are secured by using both hands and head. Thinking about the work, trying to figure out how to do it better, more quickly, or more easily with the implement being used, or with some other tool, removes half the so-called drudgery of garden tillage.

There are a number of mistakes to avoid in choosing garden tools. The selection of too large implements is probably the most common error. The small hoe and narrow rake are preferable to the larger sizes. They are easier to operate, can be used closer to the plants—frequently between them—and do better work with less expenditure of energy where the soil is compact. Fully three-fourths of the hoes used by home gardeners are too large and are not adapted to the various operations for which the hoe should be used. The large hoe with the rounded upper edge should be discarded for a much smaller hoe of one of the types illustrated in Fig. 9. The three-cornered onion hoe with a long handle serves efficiently more uses than any other type. A large, round-backed hoe can easily be converted into one of the desirable types by the blacksmith or tinner.

The hand cultivator. The hand cultivator has largely replaced the hoe in preserving the soil mulch of the garden. It saves time and, if properly used, does efficient work. There is also less danger of doing poor work with it than with the hoe. Most gardeners appear to think that the hand cultivator should be used in the same way that the horse cultivator is operated except for the motive power. When the garden soil is in good condition or has been very little packed, good work can be done by using the hand cultivator that way. More often, far better work would be done, although not quite so rapidly, if the hand culti-

vator were used more as a hoe should be used. A hand cultivator should be relatively light. Even durability may be sacrificed to lightness, since a heavy hand cultivator soon tires the operator. Neither the hoe nor the hand cultivator, used as a substitute for the hoe, are properly handled half of the time in restoring the soil mulch, because most inexperienced gardeners and many experienced ones do not know how to use the hoe as a tillage implement. Hoeing should stir all the soil possible

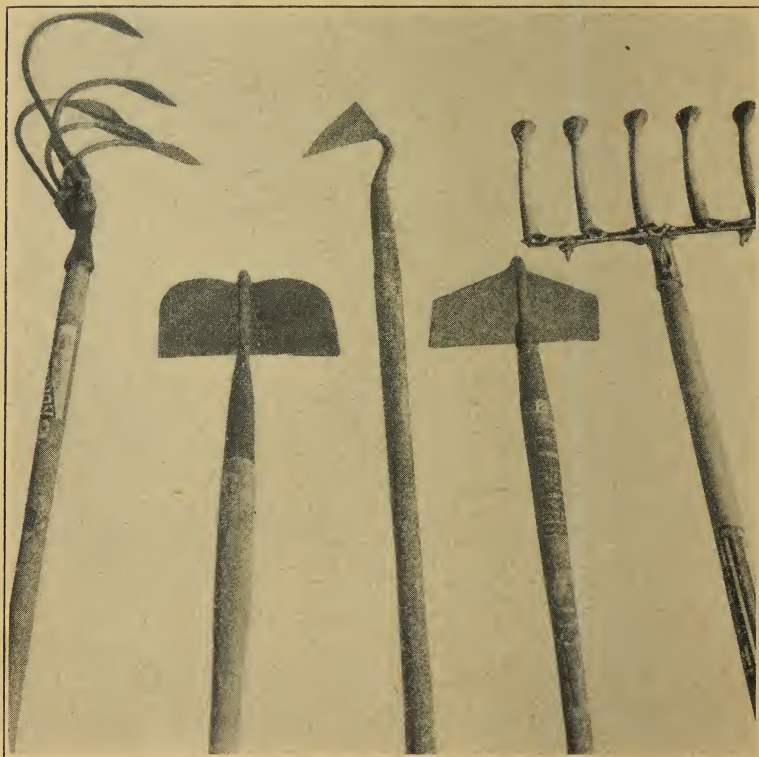


FIG. 9.—EFFECTIVE TILLAGE DEMANDS GOOD TOOLS

Discard the large hoe for one of the smaller types. The type of cultivator at the left and the one at the right are both efficient tools.

and leave the entire surface fine, loose, and level. Many gardeners pull a quantity of soil on top of an undisturbed area, and thus leave part of the soil compact and the surface in a series of small hills and hollows. Then when the hills are raked back into the hollows there is an effective soil mulch over only about half of the area. Use the hoe not only so as to stir all the soil but also to leave it level and fine. In hoeing, stir the soil closest to you first. Then, instead of pulling the soil towards you three or four inches, move it only slightly. Remove the hoe by lifting it so that at the end of the complete operation the hoe is slightly farther

from you than it was when in the soil and in the proper position for the next hoof. This method lets the loosened soil fall back nearly into its original position and entirely eliminates the necessity for raking after hoeing. The size of the "bite" taken will depend upon the kind and compactness of the soil. The hand cultivator used in the same way is probably the most efficient tillage implement for a small garden.



FIG. 10.—AN EFFICIENT WHEEL HOE SAVES TIME

In the larger garden the wheel hoe—chosen for its lightness and simplicity—should take the place of the hand cultivators.

The wheel hoe. In the larger garden the wheel-hoe should take the place of the hand cultivator as it reduces the time required to keep the surface soil in the desired condition. It is easily possible to reestablish the soil mulch on a garden 40 x 120 feet in an hour and a half with a good wheel hoe properly used. There are many kinds of wheel hoes and different gardeners have their favorites.

A wheel hoe need not have a large number of attachments in order to be efficient. Frequently there are so many attachments that the gardener is at a loss which one to use. The following points, however, should be considered in making the selection: The hoe should be light and simple. Lightness is important because the cultivator often will have to be lifted at the end of the row. One light enough to be swung into the next row saves time and energy. Simplicity lessens trouble in adjustment and in loss of parts and repairs. Durability is usually taken care of by the manufacturer. Heaviness of construction does not necessarily mean increased durability, but does increase the work of operating the hoe. As in the case of the hand cultivator, durability is of second importance.

The wheel hoe should be equipped with teeth fitted to tear up the soil deeply if desired or to establish a good mulch. Frequently the cultivator teeth are too short and set close together in a straight row. It is impossible to do good work quickly with this type unless conditions are very favorable. The teeth should be rather long and narrow, preferably "staggard."

The wheel hoe should have an attachment for loosening the soil close to the row when plants are small—without covering them—and for the eradication of weeds. Some weeds are not readily removed by the cultivator teeth. Cultivating deep enough to uproot weeds destroys too many vegetable roots and causes loss of time or plants through covering them. An attachment of the scuffle hoe type meets these needs very well.

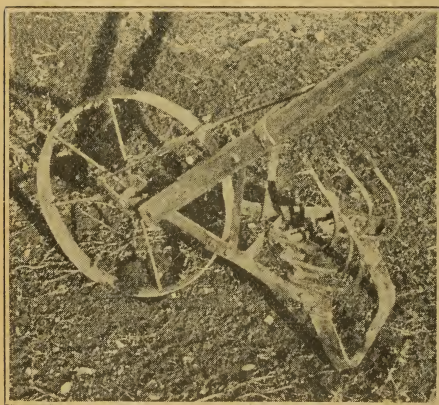


FIG. 11.—USING THE SCUFFLE HOE

The same hoe shown in Fig. 10 with the cultivating part reversed.

The handles should be so attached as to give the greatest return for the power applied.

A good wheel-hoe will not ne-

cessitate the operator imitating a half-open jack knife while operating it. The grip on the handle should be natural and firm so that the pressure comes on the entire ball of the hand and in a line passing through the the fore-arm. The "plow-handle" type is not easy to use in operating a wheel-hoe, neither is the greatest efficiency nor comfort secured when the handle is grasped with only part of the hand.

Many gardeners become so intent in hoeing that they overlook its purpose. It does little good to establish a soil mulch and destroy it immediately by tramping the loosened soil. Have as few footprints after cultivating as practicable, whatever the tool. With this purpose in mind it is possible to quickly devise ways of reducing the tramping without loss of time or efficiency in tillage.

WATERING

The garden needs less water when properly tilled; a good soil mulch is much more effective than watering as it is usually done. Watering frequently does more harm than good chiefly because insufficient amounts are used. Quite often when the garden is watered the deficiency in soil moisture is increased. Water is put on in comparatively small amounts in a way to pack the surface soil. The hot sun soon dries out this packed soil causing it to bake and thus increases the loss of moisture.

Over-head irrigation is the only really satisfactory method of applying water to the garden. Other methods can be used but greater care will need to be exercised not to bring about unfavorable conditions. The following points should be kept in mind in applying water:

Preferably, apply in the evening. This gives the water a better chance to soak into the soil.

Apply enough water to wet the soil at least two or three inches deep. If applied in the evening, the water will have soaked deeper into the soil before morning. Small, frequent applications are usually more injurious than beneficial.

Re-establish the soil mulch just as soon as the soil is fit to work. Delay in doing this will result in unnecessary loss of moisture.

Wilting is not always an indication of lack of moisture. It is quite likely to occur on bright days after a prolonged period of dark, damp weather. In determining the necessity for watering, examine the soil below the layer of soil mulch as well as the plant.

GARDEN PESTS

The gardener must wage a vigorous warfare against the various pests which attack his plants, or his crops are likely to be either greatly reduced or entirely destroyed. Most garden pests are either insects or diseases. Of these, the former most often demand control measures although the latter also frequently cause considerable losses.

A few simple measures applied at the right time will usually control most of the pests. To do this successfully, however, the gardener must ever be on the lookout for pests and apply control measures before the pest becomes wide spread or does much damage. The application of poison to potato vines after the beetles have eaten off the leaves is a waste of time and material so far as that particular hill is concerned.

Garden sanitation. One of the first things for the gardener to observe is "garden sanitation." Frequently garden pests, both insect and disease, are carried over in the waste material of the previous season's crop. While working refuse material into the soil is commonly recommended, one should be sure that in so doing he is not inviting trouble for next season by providing a pest to be controlled. Burn leaves, stems, or other refuse if there is the least suspicion that they may be a source of infestation. Sanitation should be a continuous practice; not left to a general clean-up in the fall or spring.

Rotation of crops. This is one of the best methods of avoiding pests in ordinary farm operations. While it is not possible to realize as much benefit from crop rotation in the city garden—especially as regards insect pests—it is of some value in certain instances and frequently of great value in particular diseases.

In the case of insects which pass the winter in the upper layer of soil, *fall tillage* which exposes the pest to the unfavorable temperature changes and to the attack of birds helps materially.

Removal of weeds. Another sanitation measure is the removal of weeds or other plants upon which the garden insects feed, from the garden or its immediate vicinity. Very frequently there would be no serious trouble from a particular insect if its presence had not been encouraged by such plants.

Trap plants. Plants started in advance of the regular crop, upon which the insects may collect and then be destroyed, is often found to be a satisfactory method of control. Frequently if the first insects to appear are destroyed, there is little probability of depredations later on. This is true of many aphids, the squash bug, and several others.

Trapping. This is a useful method in some cases. Short pieces of weathered board, clods, or stones, are put close to the plants in order that the insect may find shelter at certain times. It is then an easy matter to destroy the insects when they have collected underneath the protector. This is a favorite method of many in controlling the squash bug.

Hand picking. This is used in the case of insects which are usually not very numerous, or when the number of plants is small. This is usually the most satisfactory method with the tomato worm. It is also very helpful in the case of potato beetles, cucumber beetles and cabbage worms.

Destroying plants. Stalk borers, root maggots, and bacterial wilt usually necessitate the destruction of the plant or the portion attacked. Such pests are often detected by the wilting of the plant, even though it is evident that there is sufficient soil moisture. Immediate destruction reduces the possibility of a spread of the trouble to other plants, or of infestation from this source the following year.

Spray materials. The majority of insect pests and plant diseases are controlled by the application of spray materials. In order to spray intelligently it is necessary to determine what the pest is—if an insect, how it takes its food—and how it is most easily destroyed. This information is usually not all gained by the beginner in his first or even in his second year.

An examination of the plant usually shows how the insect takes its food. Not infrequently, however, the pests are so numerous that waiting for the action of an insecticide would result fatally; and the gardener must decide whether even more direct methods may not be necessary to save the crop. This is especially true in the case of the striped cucumber beetle, the flea beetle, and blister beetles.

General methods of control for ordinary cases. If an insect eats the foliage or exterior parts of plants it may be controlled by such

TABLE II.—COMMON GARDEN INSECTS OF WISCONSIN

Vegetable	Insect	Stage in which damage is done	Damage	Control method*
Asparagus....	Asparagus beetle	Adult-larva..	Eats foliage and young shoots	1-2-9
Bean and pea.	Pea weevil.....	All stages....	Burrows in seed.....	3
	Bean weevil.....	All stages....	Burrows in seed.....	4
	Pea aphid (louse)	All stages....	Sucks juice from foliage	5
Beet.....	Blister beetle....	Adult.....	Eats foliage.....	2-6-13
	Flea beetle.....	Adult.....	Eats foliage.....	2-6
	Leaf beetle.....	Adult.....	Eats foliage.....	1-2-6
	Beet aphid (louse)	All stages....	Sucks juice from foliage	5
Cabbage.....	Cabbage maggot.	Larva.....	Base of stem and root	7-8
	Cabbage worms.	Larva.....	Eats foliage.....	2-9-10
	Cut worms.....	Larva.....	Cut off plants.....	(See general)
	Cabbage aphid...	All stages....	Sucks juice from foliage	5
	Cabbage leaf miner	Larva.....	Mines through leaves	11
Celery.....	Celery caterpillar	Larva.....	Eats foliage.....	13
Corn (sweet)..	Cut worm.....	Larva.....	Cuts off stem.....	(See general)
	Corn ear worm..	Larva.....	Eats seed on cob.....	2-18
Cucumber....	Cucumber beetle	Adult-larva..	Eats foliage; destroys roots	2-12-13
	Squash bug.....	Adult-larva..	Sucks juice from stems and foliage	1-12-13-14-15
	Pickle worm....	Larva.....	Eats fruit.....	1-9
	Melon aphid.....	All stages....	Sucks juice from foliage	5
	Squash vine borer	Larva.....	Burrows in vine.....	1-11
Eggplant.....	Flea beetle.....	Adult.....	Eats foliage.....	2-6
	Potato beetle....	Adult-larva..	Eats foliage.....	2-6-13
Melon.....	Same as cucumbers			
Onion.....	Maggot.....	Larva.....	Burrows in bulb.....	No satisfactory method
Potato.....	Potato beetle....	Adult-larva..	Eats foliage.....	2-6-9-13
	Potato flea beetle	Adult-larva..	Eats foliage.....	2-6
	Blister beetle....	Adult-larva..	Eats foliage.....	2-6
	Potato stalk borer	Larva.....	Burrows in stem.....	8
Radish.....	Maggot.....	Larva.....	Burrows in roots....	No satisfactory method
Squash.....	Same as for cucumbers			
Tomato.....	Tomato worm...	Larva.....	Eats foliage.....	13
	Tomato stalk borer	Larva.....	Burrows in stem.....	11
General.....	Cut worms.....	Larva.....	Eats foliage and base of stems	16-17
	Leaf beetles....	Adult.....	Eats foliage.....	1-2-6
	Blister beetles..	Adult.....	Eats foliage.....	1-2-6-14
	White grubs.....	Larva.....	Eats roots and base of stems	18

* Numbers refer to "Methods of Control" listed on page 30.

poisons as arsenate of lead, paris green, or hellebore. If the insect merely sucks the juice from the plant, poisons are valueless; and a material which kills by coming in contact with the pest, as nicotine sulfate or kerosene emulsion, is necessary.

If the attack is on the interior of the plant, removal of the affected part may be necessary. In the case of seeds, fumigation may be required.

Some knowledge of various insects is necessary in order to identify some of our less common insect pests which are very troublesome at times. Send a specimen of the pest to the Agricultural Experiment Station at Madison if you are not sure what it is or how to control it.

Table II is a list of the more common insect pests of vegetables. Numbers refer to methods of control and formulae for spray mixtures listed below.

Fungus diseases—Use bordeaux mixture to prevent both infection and spread of disease.

METHODS OF CONTROL

1. Trap plants.
2. Dust plants with air slaked lime and paris green or with arsenate of lead. Repeat at intervals as often as insects reappear.
3. Fumigate seed with bisulphide of carbon before planting.
4. Same as 3 but as soon as harvested.
5. Kerosene emulsion or nicotine sulfate. Nicotine sulfate at times gives undesirable flavor to salad crops.
6. Bordeaux mixture containing arsenate of lead or paris green.
7. Protect plant by tarred paper protector about 3 inches in diameter fitted closely around base of plant.
8. Burn badly infected plants as soon as discovered.
9. Arsenate of lead or paris green in water.
10. Fresh hellebore or pyrethrum may be substituted for 9.
11. Destroy infected part as soon as discovered.
12. Cover plants with hill protectors.
13. Hand picking—should be done daily until further injury is unimportant.
14. Use traps—board, sticks, clods, or stones. Adult insect hides under them. May be found early in the morning or late in the evening.
15. Mash eggs—usually found on under surface of leaves.
16. Poison bait (1) vegetable; spray clover with paris green or arsenate of lead, scatter fresh material around plants in the evening; (2) bran mash; white arsenic or paris green two ounces; bran three pounds. Dissolve 1 ounce salt and 2 ounces cheap syrup in a small quantity of water. Mix thoroughly and add enough water to make a crumbly mash.
17. Protectors: dirt bands, tin can or strawberry box.
18. Fall tillage.

FORMULAE

- Arsenate of lead (powder) or paris green (applied in water) $1\frac{1}{2}$ ounces to 2 ounces to 3 gallons of water.
- Arsenate of lead (powder) or paris green (applied dry) 1 ounce to 3 to 4 pounds sifted air slaked lime or flour.
- 40% Nicotine sulfate (Black leaf 40) 1 teaspoonful, 1 ounce of soap in solution; water to make six quarts.
- Kerosene emulsion— $\frac{1}{2}$ to 1 pound of soap dissolved in one gallon of hot water. Remove soap solution from the stove, add 2 gallons kerosene, agitate violently until emulsified. Then dilute with water to strength desired, usually 5 to 7 per cent.
- Bordeaux mixture—4-4-50 formula.

Snap beans or tomatoes that have been sprayed with poisons shortly before using should be thoroughly washed. There is no danger of poisoning by eating cabbage sprayed with poison but the leaves removed in preparing it for use should not be fed to stock without thorough washing. Cauliflower, after it begins to head, should not be sprayed with arsenate of lead or paris green.

Disease control. The only effective spray material commonly used in controlling garden diseases is bordeaux mixture. The 4-4-50 bordeaux mixture is most used. It is prepared as follows: Dissolve 6 ounces copper sulfate in 1 gallon of water; slack 6 ounces stone lime, being careful not to "burn" or "drown" it. Then strain the lime to remove any coarse particles which might clog the nozzle, and dilute to 1 gallon. Pour the milk of lime and copper sulfate solution together and add 3 gallons of water. If it is desired to spray for leaf-eating insects at the same time, add $2\frac{1}{2}$ to 3 ounces of powdered arsenate of lead to the bordeaux mixture. It is best to mix the lead into a thin paste before adding to the bordeaux.

STORING VEGETABLES

Storing is the best way of preserving vegetables for winter use in many instances. Storing is cheaper, requires less work, and with many crops preserves more of the characteristic flavor than when the vegetables are canned or dried.

Where to store. The home gardener may store his crops successfully in house-cellar, outside cellars, or caves and pits. All of these are not equally well adapted for storing all kinds of vegetables, but they answer the purpose very well for the majority. Where more than one type of storage is available, greater success will be had if the storage requirements of the vegetable and the time it is desired for use are considered.

THE HOUSE-CELLAR

The house-cellar is by far the most frequently used storage place of vegetables grown in Wisconsin gardens. If it does not contain a furnace and the temperature does not fall below the freezing point, there will be little difficulty in keeping the vegetables well into the following spring. If, however, there is a furnace in the cellar, then the difficulties of successful storage are greatly increased. In such cellars a small portion, preferably well removed from the furnace, should be partitioned off. The storage room should possess at least one window which will make temperature control easier. The tighter the partition fits, the better. As the storage room probably will be quite permanent, it is advisable to exercise considerable care in constructing the partition. An insulated wall or a double wall with a dead air space between is to be preferred. A heavy cement wall is satisfactory. A single board wall is not to be recommended, but a storage room with such a wall gives better results than storing in the same room with the furnace. The storage room should preferably have a dirt floor.

OUTSIDE CELLARS OR CAVES

Outdoor cellars are usually preferable to house-cellar, providing they are so constructed as to prevent freezing of the vegetables and are so located and built as to be of easy access during the winter. Some gard-

eners have an entrance to their outside cellars through the house cellar. This overcomes the most objectionable feature of the outside cellar,—gaining access to the cellar during bad weather. The outside cellar eliminates any unpleasant odors indoors due to decaying vegetables.

PITS

Pits are the last resort in vegetable storage. If they are to be used, it is far better to store a small quantity of each of the vegetables requiring the same storage conditions together in a pit than to put all the different vegetables in separate pits or in one large pit. The small pits require more work but make it possible to remove all the vegetables at one time thus eliminating the necessity for closing the pit, which is a very disagreeable and frequently unsatisfactory operation. Just enough vegetables should be put into a pit to make it possible to use them before they deteriorate greatly.

Requirements of successful storage. The three chief essentials of successful storage are: sound vegetables, proper temperature, proper moisture. With certain vegetables maturity and ventilation are also of prime importance. Many people overlook the first of these storage requirements. Careful selection should be made of all vegetables to be stored. Soundness should include freedom from disease conditions likely to cause rot, and from mechanical or insect injury which provides an entrance for rot organisms or favorable conditions for their development. It is not the loss of the affected vegetable which is so important, but the fact that decay once started may destroy a considerable portion of the stored crop. The importance of soundness, however, does not stop with the selection of sound specimens. It includes careful handling during the storing process. All of us handle fruits which are to be stored with the utmost care, but practically disregard the bruising of vegetables. While the results are not so marked in the case of vegetables, often much of the loss in storage may be traced directly to rough handling.

STORAGE TEMPERATURES FOR VEGETABLES

The best temperature for storing vegetables may vary considerably for different kinds. There are two fairly well defined limits for most vegetables. The temperature should not be so low that the vegetables freeze. It should not be so high as to encourage premature growth. High storage temperature is also more favorable to the development of most rot organisms, therefore with most vegetables the desired temperature is one close to the freezing point. Some vegetables, as cabbage, will stand slight freezing without injury, but it is usually safest to maintain the temperature of the storage room at not less than 31 or 32 degrees Fahrenheit. Vegetables will keep well at somewhat higher temperatures, 35 to 40 degrees, but only in the case of squash and pumpkin is a relatively high temperature to be preferred.

SUPPLY SUFFICIENT MOISTURE

Large losses occur in storage because of improper moisture supply. The greater part of these losses is due to lack of sufficient moisture. The moisture content of all vegetables is high. When placed in a dry atmosphere, they lose moisture very rapidly and with it their quality. With the exception of onions, squash, pumpkins and dry seeds, as beans, a relatively moist atmosphere is desirable. Excessive moisture is injurious, as it furnishes favorable conditions for rots. The aim, therefore, with most vegetables, is to keep the surroundings sufficiently moist to prevent wilting.

OTHER STORAGE REQUIREMENTS

Good ventilation is desirable for the best storage. It helps to regulate temperature and moisture, removes foul odors and may help to prevent decay.

Proper maturity influences storage. With some crops full maturity is necessary, with others slightly immature specimens store best, while with some the stage of maturity makes little or no difference.

STORING SPECIAL CROPS

Cabbage. The Holland or Danish Ballhead type is best for storage, although Succession, Sure Head, Flat Dutch, and other varieties of the mid-season type store fairly well. The essentials of satisfactory storage are low temperature, moist atmosphere, no hard freezing, absence of excessive moisture, and good ventilation.

For cellar storage the stems and outer leaves are removed and the heads wrapped in several thicknesses of newspaper or in heavy paper. Occasionally it is stored in boxes and covered with sand. When stored by this method, it is particularly desirable to keep the temperature near the freezing point to prevent premature growth. It may also be stored without removing the stem and roots. If this method is used the roots are usually covered with soil which is kept slightly moist. Some store by suspending the plants by the roots from the ceiling.

Celery. Many home gardeners have difficulty in storing celery. This is usually due to the fact that the crop is stored before it is possible to maintain the proper temperature in the storage or because the plants have been subjected to too severe freezing before harvesting. It is rather exacting as regards storage conditions and care must be exercised to meet as fully as possible its requirements.

Celery to be stored in the cellar should be kept in the garden as late as possible without severe freezing. Protection should be given to prevent frost injury so as to retard the bringing in of the crop. This may be done by banking the plants with earth to within two or three inches of the tops. On cold nights the tops should be protected with mats, blankets or similar devices. The danger of harvesting and storing celery as soon as the first hard frosts come is that comparatively warm weather is likely to follow, the temperature of the storage runs too

high and the stalks decay. When steady cool weather comes, the plants may be harvested. Harvest when the plants are dry. Handle carefully so as not to bruise the stalks. Preserve a goodly part of the root system and leave as much soil adhering to it as convenient. Set the plants together closely on a two or three inch layer of sand or light soil and cover the roots with soil. Protect the outside plants with boards. If a goodly amount of soil has been left on the roots, additional soil will not be necessary.

The temperature must be kept low, the top of the plants dry, the storage place well ventilated, and the soil on the roots sufficiently moist to prevent wilting. It is advisable to provide some method of applying water to the layer of soil without getting the leaves of the plants wet. Drain tile placed at intervals among the plants, or a simple system of sub-irrigation, are useful in keeping the soil properly moist. A 1-inch tin tube, made from that used for speaking tubes in flats, may be employed successfully. A short piece of tubing is soldered at right angles to the main or horizontal piece. A cork is then put in the end and small holes made at intervals of 12 to 15 inches along the horizontal piece. After the celery has been placed in storage, tubes of this kind are placed over the surface of the soil at intervals of about 2 feet. Water is applied as needed by inserting a funnel in the upright portion of the tube. Care must be taken to apply enough water without giving an excess which would encourage rot. Celery stored by this method will usually make some growth; and if green varieties are grown, blanching will take place in storage.

Celery may also be stored out-of-doors. The trenching method is probably best adapted to Wisconsin conditions. During the early fall, the plants are handled as for cellar storage. When there is danger of freezing, the crop is harvested and placed in trenches. The plants are practically transplanted close together in the trench. These may be shallow or as deep or deeper than the length of the plants. In shallow trenching, boards are placed along the outer plants and then banked with earth. This is continued to the top of the plants and the top is covered with boards. Straw, leaves, or other litter is placed over the boards until the weather is severe enough to make permanent covering necessary. Then enough additional banking and covering is put on to prevent freezing of the plants.

In deep trenching, only covering is necessary. It is more difficult, however, to put in the last plants unless the trench is somewhat longer than needed for storing the crop. It is advisable to water the soil in the bottom of the trench before putting in the plants. The chief disadvantage of this method is the difficulty of getting the celery for mid-winter use.

Onions. The essentials of successful onion storage are fully matured well-cured bulbs, dry atmosphere, good ventilation, and a relatively low temperature. Onions will stand some freezing if they are not handled while frozen, but it is better to keep the temperature somewhat above the freezing point.

Onions to be stored are commonly harvested in August and September. When the tops are dead and shriveled and the outer skins of the bulb dry, the onion is ready to harvest. Harvesting may be hastened somewhat by breaking over the tops. On large areas it is accomplished by running a barrel or light roller over them. The tops may be broken over when they begin to turn yellow.

The bulbs are pulled, thrown into windrows, and allowed to cure for a few days. They should be stirred occasionally exercising care not to bruise them. As soon as well dried, so that the tops rattle when the bulbs are handled, they should be taken inside. If the weather is unfavorable during the harvesting period, onions may be cured in a well-ventilated room, having a dry atmosphere. Curing indoors requires a much longer period than outdoor curing under ordinary conditions.



FIG. 12.—OVERHEAD IRRIGATION FOR THE GARDEN

This is the only really satisfactory method of watering gardens.

After the bulbs have been thoroughly cured, the tops should be twisted or cut off not closer than one inch from the bulb. Too close topping results in premature sprouting.

At this time discard for storage purposes all bulbs which are soft or which have thick "necks" as they will not store well.

Onions are commonly stored in crates or bags, as they permit better circulation of air and there is less danger from moisture accumulation.

Potatoes. Mature, disease-free tubers; moist atmosphere; freedom from frost; and a low temperature insure successful potato storage. Care should be exercised in storing to discard any potatoes which have been frosted in the field. Any of the types of storage previously discussed are suitable for potato storage providing the foregoing conditions are maintained.

Root crops. Beets, carrots, rutabagas, turnips, winter radishes, and other root crops require about the same storage conditions. The

leaves should be removed before storage, but "topping" should not be so close as to break the skin of the vegetable.

A temperature near the freezing point and a relatively moist atmosphere are necessary to these crops because they suffer more from insufficient moisture in storage than do most other kinds. Loss of moisture means lost quality and texture and a practically worthless product.

For several years the following method of storing root crops has been used successfully in the cellar of a furnace-heated house. The vegetables, in amounts of 1 to 1½ bushels, are placed in boxes or put directly on the cement floor, and gunny sacks put over them. Enough water is sprinkled on the sacks as needed to prevent the vegetables wilting. Further provision is made for keeping the atmosphere moist by sprinkling water on the floor. The temperature is controlled by varying the extent to which the window is opened. In very cold weather, if the temperature falls below the freezing point in the vegetable room, the desired temperature is restored readily by slightly opening the door into the furnace room. Root crops have been kept in perfect condition until late spring by this method.

Some gardeners store root crops by packing in sand in boxes or placing in piles and covering with sand. The sand should be moistened from time to time. Do not get it too wet. Just sufficiently moist to prevent wilting is the desired condition which can be determined by examining the vegetables occasionally. In cellars with earth floors the moisture may be supplied by applying to the floor. In cellars with cement floors, some keep the atmosphere sufficiently moist by placing water in tubs or putting it on the floor. A large evaporation surface is best when these methods are used. Root crops may also be stored in pits, but must be covered sufficiently to prevent freezing.

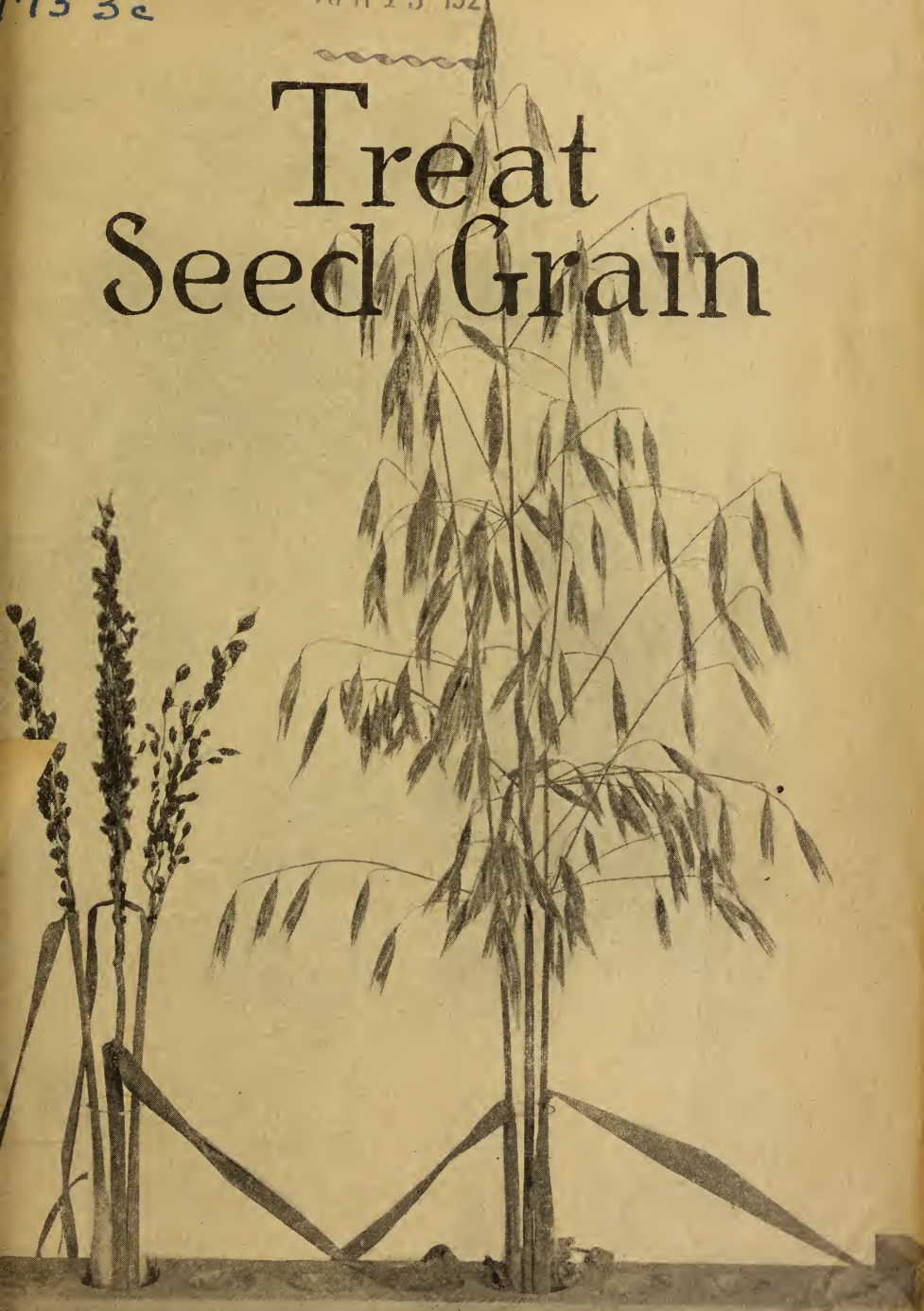
Salsify (vegetable oyster or oyster plant) and parsnips may be stored as other root crops. They are not injured by being frozen and therefore need less attention regarding too low temperatures. It is advisable to leave a portion of these crops in the garden for early spring use. They are even better in the spring than when harvested in the fall. There is quite a common belief that parsnips left in the ground over winter develop poisonous properties. Such is not the case, however. Parsnips so handled may be used without any ill effects until they become too woody to be edible.

Squash and pumpkins. These vegetables more than any other demand full maturity for successful storage. Harvest before they are exposed to severe frosts, being sure to leave a short stem. Store in a fairly dry room having a temperature of about 50 degrees. The conditions adapted to the storage of other vegetables are not very satisfactory for the squash and pumpkin, therefore the use of a separate storage room is highly desirable.

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Treat Seed Grain



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Treat Seed Grain

R. E. VAUGHAN and A. G. JOHNSON

Do you know that Wisconsin farmers lose nearly a million bushels of oats a year through smut, nearly a half million bushels of barley through smut and stripe, and thousands of bushels of wheat and rye from preventable plant diseases? With the present low prices a man cannot afford to throw away the use of so much land as is required to grow these worthless plants—robbers of his profits. Any crop that is worth growing at all is worth growing well; and efforts should be made to reduce so far as possible the annual toll taken by disease.

TREATMENT MEANS INSURANCE

Seed grain may or may not carry smut germs. But treatment is good business and cheap insurance because it takes away one of the hazards on crop losses. If you raised your own seed last year and it was free from smut, it may not be necessary to treat this year; but if there was some smut, even if only a fraction of 1 per cent, then by all means treat. Also, treat any grain whose history of last year is unknown. At the Experiment Station, a few years ago, a sample of highly recommended oats was sent in for trial. Half of this seed was treated with formaldehyde in the smut machine, and half left untreated for check. Result,

SMUT

Spreads with seed
Grows inside plant
Makes black heads
Reduces yield
Lowers quality
Killed by formaldehyde

no smut where the treatment was used and 37 per cent smut where seed was not treated (Fig. 1). It pays to be on the safe side, and the premiums are low.

USE TREATMENT AND SENSE

Seed treatment is not a "cure all." It can never take the place of good soil preparation and drainage and the use of



FIG. 1.—OAT SMUT REDUCES YIELD

Sheaf of oats at right from treated seed, two sheaves at left from untreated seed, 37 per cent of plants smutted in center sheaf.

vigorous strains of seed that have been well cleaned by a good fanning mill. Treated seed also will rot in cold, wet ground just as does untreated seed under the same conditions. It is a fact, however, that since treated seed has taken up some moisture during treatment, germination is more rapid in the

soil and the stand is much more uniform than that from untreated seed, especially under dry conditions. Seed treatment is an operation to be added to good, clean seed and good culture.

LIMITS OF SEED TREATMENT

Seed treatment is without value in the control of grain rusts of both the stem and leaf varieties. Nor is it of value in controlling the net blotch and spot blotch diseases of barley. The loose smut of barley and the barley stripe disease can be checked by using the two-hour soaking method, as in process No. 1.

SEED TREATMENT

The most effective method of treating grain on the farm is the formaldehyde (trade name formalin) seed treatment. While this will not fully control the loose smuts of wheat and barley, it is very effective in controlling the smuts of oats, the covered smut of barley, the bunt or stinking smut of wheat, and the stalk smut of rye. The cost of treatment varies with the labor available and the market price of formaldehyde, but at most it amounts to only a few cents a bushel. Farmers may club together and reduce the cost. The county agents and farm bureaus are always glad to assist in this work.

DIRECTIONS FOR FORMALDEHYDE TREATMENT

The solution used is made up as follows: 1 pint 40 per cent formaldehyde in 30 to 35 gallons of water. The processes

FORMALDEHYDE SOLUTION

Formaldehyde 1 pint

Water 30 gallons

Mix well

may be more or less varied, but those given have been found by experiments to be best suited to Wisconsin conditions. Barrels or tanks are not injured by formaldehyde and may be

used for holding the solution when soaking or dipping the seed. The solution may be used several times, but preferably not more than four or five times.

CAUTIONS TO BE OBSERVED

1. Always run the seed through a good fanning mill before any treatment is given. This will remove many of the blighted



FIG. 2.—BARLEY STRIPE CAN BE CONTROLLED

1. Shattered leaves, dwarfed head with awns tied into seed leaf. Plants frequently die before reaching heading stage. 2. Young leaves show yellowish stripes which later turn brown. 3. Healthy barley plant. Note bending of stalk with weight of grain.

kernels, the spore balls, many of the free smut spores, and dirt.

2. Avoid freezing the wet grain. Freezing would lower or destroy germination.

3. When the seed has been treated and is yet damp and swollen the seeder or drill should be set to sow one-half bushel (barley or wheat) to three-fourths bushel (oats) more to an acre than the usual amount.

PRACTICAL DIRECTIONS FOR SEED TREATMENT

No. 1. Treatment best for barley. One pint 40 per cent formaldehyde to 30 gallons of water, temperature 60° F. Soak the seed in loosely filled burlap or gunny sacks for two hours. Drain on slats over the barrels or tanks to avoid wasting the



FIG. 3.—DRAINING GRAIN AFTER TREATMENT

This method of treatment makes it possible to use the solution several times. Formaldehyde does not injure the barrels or tanks, or spoil them for other purposes.

solution. Dry by spreading on a clean floor or canvas and stirring occasionally with rake or shovel. It will dry faster if the wind can blow over the wet grain. Sow as soon as the seed will run freely, or dry thoroughly and store in clean bags or bins until it is planted. Barley requires a *two-hour* treatment to kill the leaf stripe and loose smut diseases.

No. 2. Treatment best for oats, wheat, and rye. One pint 40 per cent formaldehyde to 35 gallons of water. Dip the seed, in loosely filled burlap or gunny sacks, into the solution and soak for *five minutes*. Drain and pile the grain on a clean floor or canvas and cover with sacks of canvas for two hours. This covering is important as it prevents too rapid evapora-

tion of the formaldehyde. It is difficult to dry oats if long treatment is applied. Dry and handle as in Treatment 1.

No. 3. Treatment sometimes used for oats, wheat, and rye, but not recommended when Treatment No. 2 can be used. One pint 40 per cent formaldehyde to 35 gallons of water. Sprinkle the solution on the seed, using about one gallon to the bushel, shoveling over at the same time to make sure of thorough and uniform wetting. Cover in a pile of clean bags



FIG. 4.—MACHINE TREATMENT FOR OAT SMUT

This method of applying formaldehyde solution is also satisfactory for the control of bunt in wheat, covered smut in barley and smut in rye. Use the fanning mill before treating to remove light seed, weeds and chaff.

or canvas and handle as in Treatment 2. The effectiveness of this treatment depends upon the thoroughness of wetting and care in covering. If any part of the seed is left dry the smut may live.

No. 4. Dry method recently introduced for oats. One pint 40 per cent formaldehyde to one pint of water. Put this solution in a quart atomizer or hand sprayer, and spray onto the grain while it is being shoveled over on a clean floor or canvas, holding the atomizer close to the grain. One quart is enough for 40 to 50 bushels of oats. Then pile and cover for 5 hours. There is no danger from freezing or heating,

and because the grain is not swollen there is no need to increase the amount to be seeded.

No. 5. Smut machine treatment is satisfactory for oats, wheat, and rye. There are several machines on the market which have mechanical devices for carrying the grain into the dilute (1-35) formaldehyde solution and then into bags. The bags should be tied tightly and covered up with a blanket for a few hours to get the full benefit of the formaldehyde. Dry and handle as in Treatment 1. Oats will dry out well enough to be sown the next day if the sacks are allowed to stand so that they do not touch one another. Otherwise, dry and handle as in treatment 1.

USE FORMALDEHYDE

The two-hour soaking method is best for barley. It gets the stripe and covered smut and greatly reduces loose smut—1 pint to 30 gallons water.

Five minutes is best for oats, wheat, and rye—1 pint to 35 gallons.

Use sprinkling can to apply solution if you do not have tanks or barrels for dipping—same strength as in No. 2.

A hand atomizer or sprayer may be used with formaldehyde and water half and half.

Smut treating machines are on the market, and many are giving good accounts of themselves.

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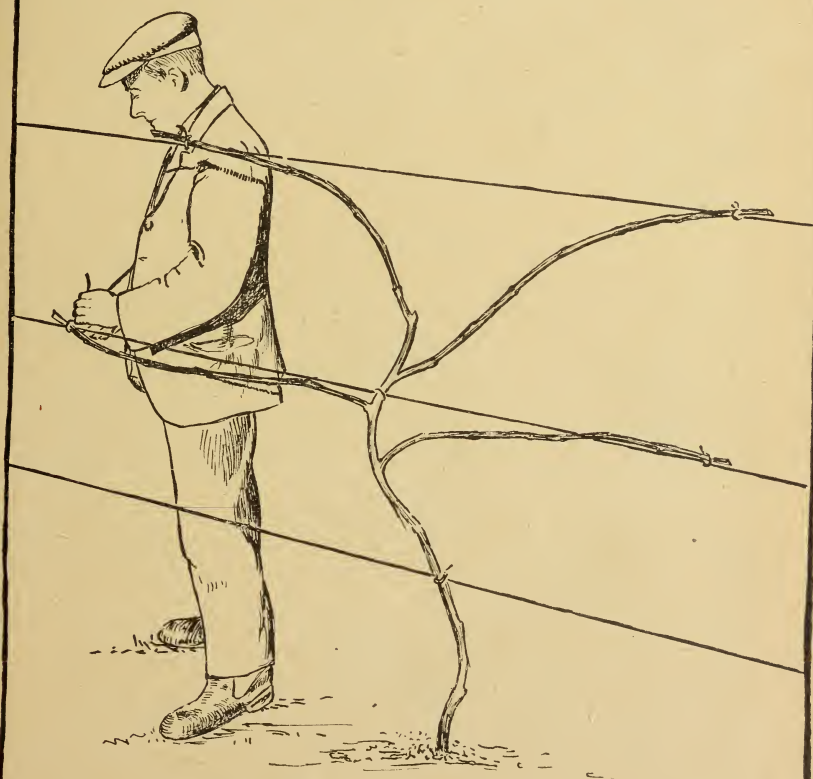
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Circular 134

March, 1921

HOW TO PRUNE SMALL FRUITS



EXTENSION SERVICE OF THE COLLEGE OF AGRICULTURE
THE UNIVERSITY OF WISCONSIN

How To Prune Small Fruits

J. G. Moore



MORE and better fruit is not the only reward for the grower who prunes his grapes, raspberries, blackberries, and currants both regularly and well. In addition, he will find that pruned plants are easier to spray and to cultivate and that their fruit is more easily harvested.

The work of pruning is not difficult if a few simple principles are kept in mind.

GRAPE PRUNING

There are a number of ways of pruning grapes but the four cane Kniffin system seems to be best adapted to Wisconsin conditions in most cases.

The best advice which can be given the grower is to prune annually, regardless of the system used. The failure to prune a grape vine even one season often necessitates two or more years to get it into proper form again. When neglected for more than one season the simplest and usually the best method is to plan to start over again at the trunk or often even at the ground.

A knowledge of certain terms is necessary to an understanding of grape pruning. The parts of the vine (see Fig. 1) are usually referred to in the following terms:

Trunk. The main stem or body of the vine.

Arm. A portion more than one year old arising from the trunk.

Cane. A one year old growth arising from the trunk or arm.

Shoot. The unmaturing growth of the season. The shoot bears the fruit. It becomes a cane at the end of the growing season.

Spur. A short growth one or more years old, left when cutting back the cane for one or more seasons.

Renewal. A cane arising from the arm, trunk, or base of the plant which is to replace (renew) an older portion of the plant. A high renewal comes from the upper part of the trunk or from an arm; a low renewal comes from the lower part of trunk or from the base of the plant.

A shoot becomes a cane. A cane cut back moderately and allowed to persist becomes an arm. If it is cut back to two or three buds it is considered a spur.

Grapes are usually one to two years old when planted in the vineyard and possess from one to three or four canes. The roots should

usually be cut back somewhat in planting to make the operation easier but it is desirable to leave a relatively large amount.

Top pruning consists in cutting off all the canes except a strong one as near the surface of the ground as possible. The one left should be cut back leaving only two or three buds at the base. (See upper left, Fig. 2.)

If grape vines are to be laid down for winter protection the pruning is done in the fall. Otherwise it may be done any time after the leaves fall until early spring. In this description it is assumed that pruning is done in the fall.

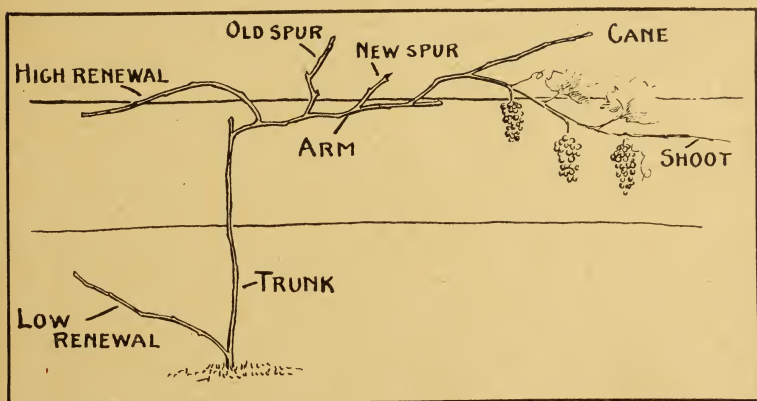


FIG. 1.—TERMS USED IN GRAPE PRUNING

The words in this diagram are explained on page 2.

During the first season's growth the buds left at pruning should have produced shoots of considerable length. If the grower is not satisfied with the development made, pruning in the fall may consist in cutting the plant back the same as when it was planted. This is frequently necessary with one-year old plants or weak two-year old plants. If the growth has been satisfactory, pruning will consist in removing all the shoots which have now become canes, except a strong one, preferably the one arising nearest the ground. This cane should be cut back so as to not quite reach the top trellis wire, which ordinarily should be about $4\frac{1}{2}$ to $5\frac{1}{2}$ feet above the ground. (See upper right, Fig. 2.)

Several of the buds along the cane should produce strong growths during the second season. Pruning the second autumn will consist in cutting off all new growths except those desired for further developing the plant and in heading-in the canes thus selected.

In the four cane Kniffin system two canes are selected for each trellis wire. These canes are then cut back leaving from six to eight buds on the upper ones and four to six on the lower canes. (See lower left, Fig. 2.)

Most of the buds left will produce shoots during the third season. Pruning at the end of the season will consist in removing superfluous wood and heading-in the canes left. In saving the canes for the fourth year it is desirable to select those nearest the trunk if they are sufficiently strong. (See lower right, Fig. 2.) In selecting the canes it is better to save those of medium growth rather than the very large ones. This is particularly true on plants making very heavy growth, as Concord or Worden. On vines of comparatively light growth, relatively stronger canes may be saved.

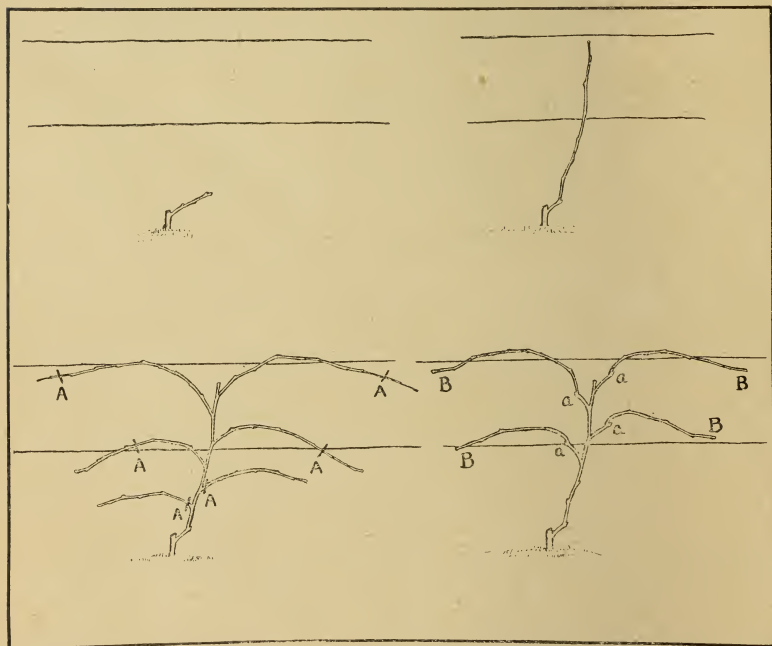


FIG. 2.—PRUNING AT DIFFERENT AGES

Upper left, vine after pruning at planting; **upper right**, vine at beginning of second season; **lower left**, vine at end of second season showing (A) where cuts should be made; **lower right**, vine pruned at end of third year, (a) points at which old canes were cut off, (B) points at which new canes were headed in. (Compare with lower left.)

The canes left should be cut back. The number of buds to be left on each cane depends somewhat upon the variety and the vigor of the particular plant. Usually a few more buds are left than in the previous season. The usual number is from eight to ten on the top canes and six to eight on the bottom ones.

The pruning for succeeding years is the same as for the fourth year. Sooner or later the first shoot arising on the cane will be farther from the trunk than it is desirable to have the new cane. When this occurs

it is necessary to take out a renewal. This may be a cane arising on the arm, on the trunk, or even on one of the other old canes. As vines get older there is a lessening tendency to produce strong growth near the head of the vine so that frequently renewal wood is secured with difficulty. It is often advantageous in providing renewal wood to leave each season a spur or two on the trunk so as to encourage the development of vigorous growth from the trunk which may be used for renewals if desired.

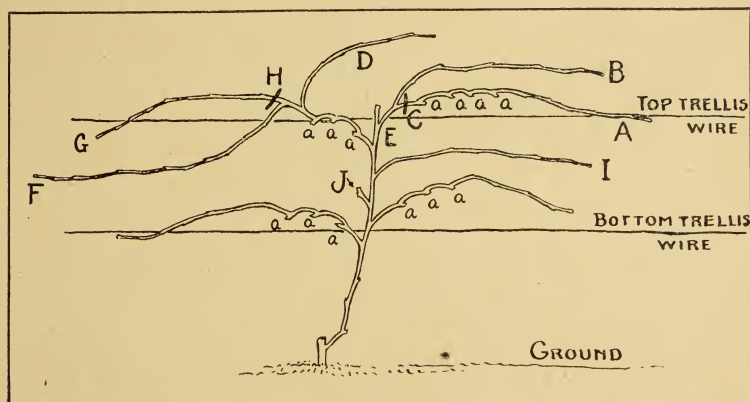


FIG. 3.—DIFFERENT SOURCES OF HIGH RENEWALS FOR CANE A

- B. Renewal from arm. Old arm to be cut off at C.
- D. Renewal from another cane. If this renewal is used top of vine will be removed at E. Cane F will be used for other top cane.
- G. Should be removed at H.
- I. Renewal from trunk. If this renewal is used top of vine will be removed at E.
- J. Spur left for producing possible renewals.
- a. Points at which old canes have previously been removed.

At times it becomes desirable to renew the entire top. This is done by taking out a renewal from the base of the plant. This renewal should be selected at least one year in advance of removing the old top; and if it is done two years in advance less time will be lost in getting a full crop of fruit. A young vine produces many shoots from its base but as it grows older this tendency decreases and in some cases the plant refuses to develop shoots from the base. When the plant is young all of these shoots should be removed. Later on, however, it is advisable to remove all but one and cut that one back to a spur. This method continues the habit of growth from the base and makes it possible to secure low renewals if desired.

RASPBERRY PRUNING

Raspberry pruning consists in removing the fruited canes, removing canes not needed for production, and heading-in the canes which are left. Growers do not entirely agree on the details of these operations,

therefore pruning practice with the bramble fruits differs somewhat with the particular grower.

Raspberry canes, other than those of the so-called ever-bearing varieties, fruit but once, therefore they should be removed. Opinion differs as to whether this should be done immediately following harvest or left until spring. Both times possess some advantages. In most cases removal immediately after harvest is preferable.

The removal of unneeded canes usually takes place in the spring. Although set out as individual plants the red raspberry tends to develop a matted row. It is a good plan in pruning to maintain the original plants more or less closely. In some cases the bushes are planted in check rows and the individuality of the plant is maintained rigidly. Home plantations are seldom handled in this way, however.

There is not much uniformity in the number of canes left to each plant or hill. Four to nine marks the ordinary range. The usual number left is five or six with the black and purple cane varieties and six to eight with the reds. Some growers prefer only four or five with the reds.

Heading-in: The greatest variation in pruning practice with raspberries is in heading-in. With the reds it usually takes place in the spring and may consist in cutting off only the portion of the cane injured during the winter to cutting back the canes to about 5 feet. Occasionally growers prune back the canes to 3 to 4 feet. During the past two seasons the Wisconsin Experiment Station has carried on trials in heading-in the red raspberry using approximately these three practices. The data secured in 1919 showed little difference in the crop secured from the light and medium pruning but a marked reduction in the crop resulted from cutting back the canes severely. In 1920 the plants receiving medium heading-in out-yielded those which were given only a light pruning. The differences in some cases were quite marked. As in 1919, the severe heading-in materially reduced the crop.

Either of two methods is used in heading-in the black raspberry. It may be pruned in the same way as the red, the heading-in, however, usually being more severe. As this method requires less attention it is the one usually followed in the home plantation. The yields received are ordinarily somewhat less than where the system of "summer pinching" is practiced.

The second method is commonly designated as "summer pruning" or "summer pinching." When this method is employed the tips of the new shoots are pinched out when they are 18 to 24 inches high. To carry out this method properly it is necessary to go over the plantation two or three times during the first half of the growing season, as all the shoots will not reach the desired size at the same time.

This "pinching back" will cause side branches to develop on which the fruiting wood of the following season will appear. These side branches are cut back in the spring leaving them from 8 to 15 inches long. It may be advisable, also, when the number of new shoots is large to remove some of the weaker ones during the growing season.

Under Wisconsin conditions if summer pinching is to be practiced it should be done as early as possible. Late pinching will often result in heavy losses due to winter injury of the immature side branches.

Purple canes: The heading-in of purple cane varieties is much the same as for the black caps. With strong growing varieties, as Columbian, the summer pinching method is usually preferable. The treatment differs from that given the black varieties only in that the shoots are allowed to become $2\frac{1}{2}$ to 3 feet long before pinching takes place, and the side branches are left longer—12 to 18 inches—at the spring pruning.

BLACKBERRY PRUNING

The blackberry may be pruned in practically the same way as the red raspberry. The number of canes left to each plant is usually somewhat less—four or five. Strong growing canes may branch somewhat the first season. It is a good plan to leave some of these side branches, providing they have come through the winter in good condition. The tips of such branches should be cut back somewhat.

Some growers practice "summer pinching" with the blackberry the same as with the black raspberry. The pinching is usually done when the new growth is about 2 feet high. The shoot should not be allowed to grow 4 feet and then be cut back to 2 feet, as is sometimes done, because the effects secured will be very different from pinching at 2 feet. Some of the weaker growths may be thinned out during the growing season.

The lateral branches produced because of the summer pinching should be cut back in spring. The length of branch to be left will depend largely upon whether the variety is one which produces buds close or relatively far from the main cane. Usually 15 to 21 inches of shoot will be sufficient to produce a satisfactory crop.

CURRENT PRUNING

The pruning of currants, like that of grapes, is likely to be neglected. With both fruits the difficulty of pruning is greatly increased by neglect. Systematic annual pruning from planting should be followed.

If the root system of the currant is extensive it may be reduced somewhat at planting to make the operation easier. All weak canes should be removed and the strong ones cut back to two to four buds.

The proper pruning of the currant is determined by the habit of fruit bearing. The finest currants are produced at the base of one-year old wood and on one-year spurs arising from older wood. Older spurs produce fruit but the amount and size of the fruit decrease rapidly with age. Canes have usually passed their best fruiting after the third crop. The chief item in currant pruning is to remove canes which have passed their best fruiting and to replace them with new canes.

A good plan is to remove a definite number of old canes each year and leave an equivalent number of new canes to replace them. When

a three-year system is followed six or nine canes to a plant makes it easy to keep the balance. If a four-year system is practiced, eight canes are probably most convenient.

The three-year plan can be operated as follows: At the beginning of the second season leave six strong canes. At the beginning of the third season remove two of the canes from the previous season and leave five strong, new canes. At the beginning of the fourth season, remove one 2-year cane, two 1-year canes and leave three new canes. Thereafter the three oldest canes, those in their fourth year, should be removed and three new canes left to take their place. This will give a plant composed of three 1-year, three 2-year and three 3-year old canes.

The canes which are left annually may or may not be cut back. Some growers do no heading-in while others cut back the new canes left each year, so as to cause them to branch nearer the ground. This is more commonly practiced if the canes are unusually long.

In removing superfluous new growths on spreading varieties, those canes which have a tendency to droop to the ground should be removed. Dense, upright plants should be opened up by cutting out the new canes at the center.

GOOSEBERRY PRUNING

The gooseberry is pruned much like the currant as they have the same general fruiting habit. The common practice in well-cared-for plantations is to remove wood after it has fruited two or three years, replacing the branches removed with new shoots. The gooseberry is inclined to grow thicker than the currant and will need more thinning out. It is not so much a question as to what system is used for renewing the wood but rather that the old wood be removed and enough young wood be left to give good crops of large fruit.

Poison the Grasshoppers



EXTENSION SERVICE OF THE COLLEGE OF AGRICULTURE
THE UNIVERSITY OF WISCONSIN
MADISON

Poison the Grasshoppers

C. L. FLUKE, JR.

Grasshoppers destroy annually thousands of dollars worth of Wisconsin crops—hay, oats, rye, peas, and wheat. The use of a poison bait is one of the simple and timely measures by which the greatest part of this loss can be prevented. Good results follow when the bait is properly mixed and applied, and when the farmers in infested areas cooperate in the work. Control measures should not cost more than fifty cents an acre.

KILLING THE GRASSHOPPERS

Poisoning—Young grasshoppers are killed more easily and die more quickly than the adult winged forms. The best method of killing both young and old, however, is by poisoning with a bran bait.

THE BEST BAIT TO KILL GRASSHOPPERS IN WISCONSIN

Bran	25 pounds
or bran mixture (one-half bran and one-half sawdust)	
White arsenic or paris green.....	1 pound
Salt	1 pound
Banana oil*	12 teaspoonfuls
or 6 whole oranges (ground in meat chopper)	
Water	10 quarts

*Amyl acetate or banana oil may be obtained at any drug store.

This amount of bait is sufficient for five acres. Mix the bran, paris green, and salt in a tub or box. Pour the banana oil or ground-up oranges into the water and stir into the dry mixture until every particle of the bran is moistened but not sloppy. Add more water if necessary, but stir thoroughly before doing so. The poison is usually scattered by hand.

Lemons or oranges have nearly always been used as the attractive part of the bait. Salt alone is better than lemons alone and oranges are superior to lemons, but recent experiments in Montana have shown that banana oil and salt give the best results.

At the start it is helpful to measure off an acre and apply the amount needed for it—which is about five to seven pounds, or approximately one-fifth of the recipe given on this page. (The weight of the dry ingredi-

ents only is considered in measuring the bait.) It is very easy to use a larger amount to the acre but the bait is just as effective when used at this rate as when it is applied in larger amounts. After the first acre or two has been treated it is easy to judge the amount to use. It is necessary to apply the bait only to the infested land.

One application is ordinarily enough if all farmers apply the bait about the same time, especially if all the eggs have hatched. Ordinarily, however, it is necessary to make two or even three applications. The best thing to do is to keep applying the bait until the grasshoppers are gone.

POISON BAIT PRECAUTIONS

1. Measure the amounts carefully; do not guess.
2. Mix the materials thoroughly.
3. Add enough water to make the mash crumbly but not sloppy.
4. Apply the bait early in the morning or late in the evening.
5. Scatter broadcast, not in piles.
6. Use only about 5 to 7 pounds to the acre. Scatter the most where the grasshoppers are thickest.
7. Before applying the poison bait, keep it away from children, stock, and chickens.
8. Wash out carefully all containers used in mixing the bait; do not let the calf lick them out.

Do not use too much poison.—Use only 1 pound of the white arsenic or paris green to every 25 pounds of bran or bran mixture. If more than this is used the grasshoppers do not like the bait so well and its effectiveness is lost.

Bait not dangerous to livestock if used as directed.—Poison bait may be used with safety on pastures if the material is *scattered* at the recommended rate. All the deaths among cattle from poisoning have resulted from carelessness, either in putting the bait out in piles or in allowing cattle to get at the containers with the poison in them. For a few days chickens should not be allowed to run on the fields where the bait has been scattered.

ARSENIC A SLOW POISON

Do not look for results before three or four days after applying the poison. Arsenic, which is the active agent, kills quite slowly. Some grasshoppers will die the first day, but the majority live until the second, third, or fourth days.

DESTROYING THE EGGS

Grasshopper eggs are seldom found in cultivated fields, but usually abound in old pastures, along fence rows, ditch banks, slashings, and any place where the ground is high and not too hard.

Plowing of such areas when possible will destroy many of the eggs. After plowing use the disc freely; this will aid in cutting up the eggs and exposing them to the weather and other enemies.

COOPERATION NECESSARY FOR BEST RESULTS

As fast as grasshoppers are killed in one field they will come in from surrounding territory unless all farmers in the infested district apply the poison about the same time. All the farmers in each district affected should plan together, get in touch with their county agent, and see that everyone with grasshoppers on his farm is willing to cooperate. Materials can be purchased more cheaply in large amounts and mixed more thoroughly and correctly in a community cooperation plan. A concrete mixer may be used advantageously.

THE LIFE OF A GRASSHOPPER

The grasshopper passes through three stages during its life: the egg, the nymph or young grasshopper, and the adult or winged form.

The eggs are laid in the ground in the fall by the adult females. Each female usually lays two pods of eggs, each pod containing about 20 eggs. The individual eggs are about one-fourth of an inch long, curved slightly, and yellowish in color.

The female, upon finding a suitable place, bores a hole into the ground about an inch to an inch and a half deep. She then deposits into the hole a frothy material which acts as a protective covering for the eggs. Into this frothy substance the eggs are laid one by one until all the eggs which are then developed in the abdomen are deposited. More of this liquid is then placed in the hole to cover the mass of eggs and finally the opening is plugged with dirt. The liquid substance hardens and protects the eggs from moisture and other agencies which might injure them.

Early in the spring the eggs begin to hatch and the young grasshoppers are then ready to feed. Hatching, however, does not occur all at once because some eggs do not hatch until late in the spring or even summer.

As the young grasshoppers grow they shed their skins four or five times; and at the last shedding the wings appear and the grasshoppers are then full grown. At this stage they are extremely hungry and as fast as the food supply gives out in one place they move on to other fields.

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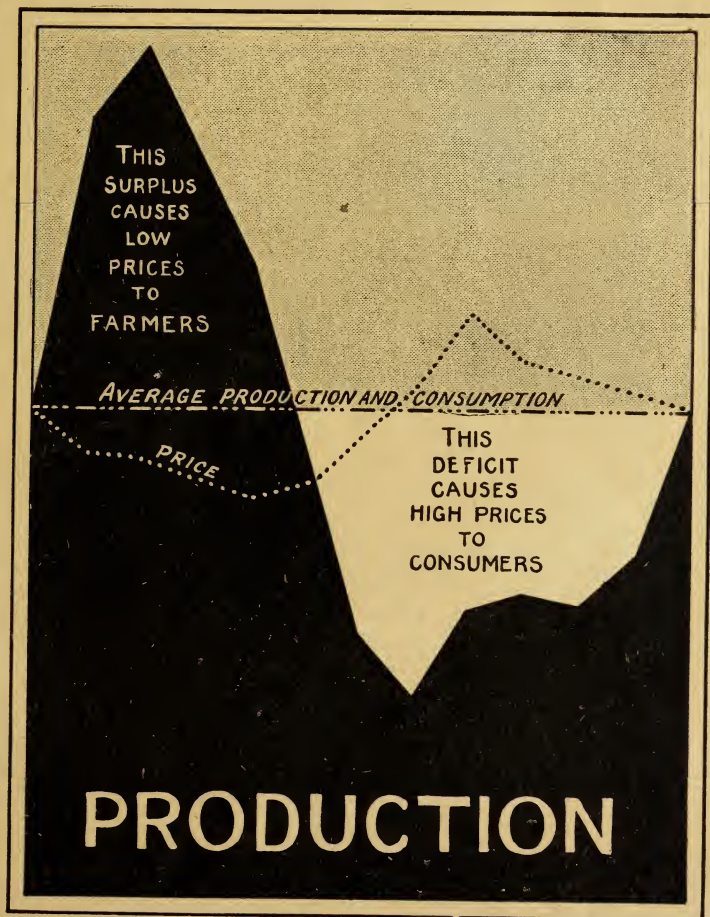
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SEP 13 1921

Circular 136

July, 1921

The Road to Better Marketing



EXTENSION SERVICE OF THE COLLEGE OF AGRICULTURE
THE UNIVERSITY OF WISCONSIN
MADISON

Can the peaks and valleys in prices, which are injurious alike to consumer and producer, be reduced by more efficient marketing methods? On the solution of this problem depends the future of American agriculture.

H. L. Russell.

The Road to Better Marketing

THEODORE MACKLIN

THE great need in marketing today is to have farm products fed to the markets of the country without market glutting. This can be done by proper organization. The stable prices resulting will be of incalculable benefit not only to farmers and consumers but to the majority of middlemen as well.

The modified system will cost less than the present one and for that reason both farmers and consumers are impatient to have it brought about. Some persons believe that products could go directly from farmer to consumer without the help of middlemen. Others, with practical experience and first-hand knowledge of what both cooperative and private marketing companies do, are positive that farmers themselves will not do the work of these middlemen. Fortunately, both groups want the same results. Their only point of difference is the means by which they would cause marketing to cost less for producer and consumer.

PRODUCTS ARE CONSUMED THROUGHOUT YEAR

The farmers' ultimate market consists of consumers located either in the home-land or in foreign countries. Consumers want food and clothing constantly throughout the year. These are the finished products made from the raw materials produced on farms. To insure low cost in the manufacture of raw material into finished articles requires middlemen who manufacture, handle, and store farm products. But these middlemen can operate with still lower expense when steady employment is given to labor and when their factories and businesses are run the year around with as nearly a uniform load as possible. Accordingly, the middlemen who change raw materials like wheat, wool, live-stock and tobacco into flour, cloth, meats and cigars, would like to buy these raw materials from month to month just as they are needed.

RAW MATERIALS ARE PRODUCED SEASONALLY

Unfortunately, farming does not lend itself to uniform production. Less is produced in winter than in summer, and in some

months than in others—while most farm crops are harvested but once a year. In other words, many more pounds of raw materials are produced in some months than it is possible to use, while in other months little or none of these goods are produced. For this reason the output of agricultural products vastly exceeds

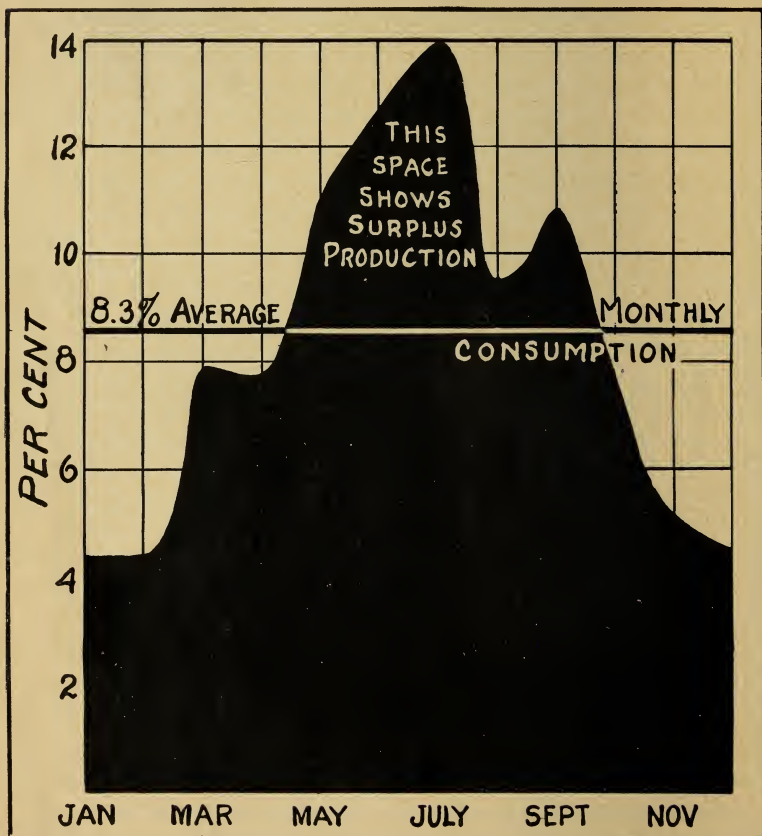


FIG. 1—FLUCTUATION IN PRODUCTION OF CHEESE

Farmers dispose of their cheese as it is produced. The black area shows when the Wisconsin Cheese Producers' Federation received cheese from its members. The "surplus production" shown above the white line is the cause of price depression. Not until a single Cheese Federation controls the storing and distributing of most of the Wisconsin cheese industries' surplus production of cheese is there any real likelihood that the fluctuation of cheese prices will be reduced or minimized.

the demand during certain seasons and falls far below the demand at other times.

SEASONAL SURPLUS CAUSES VIOLENT PRICE FLUCTUATIONS

Because farmers are unorganized and therefore unable to prevent seasonal flooding of the markets upon which their goods are sold there are violent seasonal price fluctuations. So long as the motive of the competitive private middlemen is to buy raw materials at the lowest possible price—and this means getting them from farmers who must sell during periods of seasonal surplus—there is bound to be a widespread unrest concerning marketing and much hard feeling about it. No one can hope to solve this problem of price fluctuation without first preventing the seasonal flooding of markets.

MARKET FEEDING REQUIRES ORGANIZATION

How to prevent alternate starving and flooding of the farmers' markets is a problem which no individual middleman can solve. It is far beyond the power and ability of individual, private, or cooperative middlemen. The surplus product which floods the market and depresses prices is neither owned nor handled by one or a few companies. It is divided among great numbers of middlemen each of whom sells when he thinks that the market affords him the best price. Because there is little, if any, coordination among these widely scattered, disconnected units, too many of the farmers' products reach the market in too short a time.

The surplus which causes the flooding of the markets is not caused by any one farmer alone but by all the farmers producing a given product. Each contributes but a small part to the total seasonal surplus for the industry. This, therefore, is not a local and individual problem but a country-wide group problem. The only way to hold this surplus back so that prices will be stabilized is to have all or most of the farmers of the industry organized for orderly marketing. The resulting stabilized prices work to the advantage not only of producers and consumers but of the mass of middlemen as well.

PRINCIPLES OF SUCCESSFUL COMMODITY ORGANIZATION

When farmers ask for a marketing system which will cost them less money they must realize that they want the results of federated marketing for a whole industry instead of the less satisfactory results of individual marketing for an insignificant fraction

of their industry. If farmers are to have stabilized prices and less expensive marketing they must first learn the differences between industry-wide federated marketing of a given product and individual marketing of it. They must also appreciate the principles underlying success, the responsibilities involved, and the obstacles which must be overcome.

PRODUCTION A LOCAL AND INDIVIDUAL PROBLEM

Throughout the United States, or even within a single state, some localities produce more of certain commodities than they can possibly use while they produce little or none of other articles. If the farmers of one section, for example in Wisconsin, were to attempt to sell all their cheese within the state they would have to get each resident to consume 150 pounds of cheese each year where he now takes less than 15 pounds. To dispose, within the state, of ten times as much cheese as its people now take would result in disastrous flooding of the market and ruinously low prices would be certain. The only thing that prevents such a catastrophe is that Wisconsin cheese is distributed over many states, thereby normally preventing the markets of Wisconsin from becoming dangerously flooded. *Each community in the state therefore is well able by itself to produce milk and make cheese in a volume far greater than it can consume. The farmers' most serious problems in this case arise not in producing cheese but in selling it in a way to prevent flooding of the local market.* To prevent flooding of the local market leads each cheese factory to attempt the sale of cheese outside its community.

DISTRIBUTING IS A NATION-WIDE GROUP PROBLEM

In Wisconsin there are close to 2,800 cheese factories, each one endeavoring to dispose of its surplus product outside of the state wherever it can find a buyer. Each of these numerous factories is thus attempting to locate the highest bidder without adequate marketing machinery to do this work at the lowest cost. The results are unsatisfactory because small, local producing units are not fitted to perform the gigantic task of efficient distributing of products. Any one factory knows little if anything about what the numerous other factories are doing. As a consequence a market in some distant state, offering a good price temporarily,

is soon flooded and the price is depressed because there was no way of delivering upon that market just the right amount of cheese. *Clearly the difficulty is that these many local cheese factories are both too small and are acting too unintelligently to do*

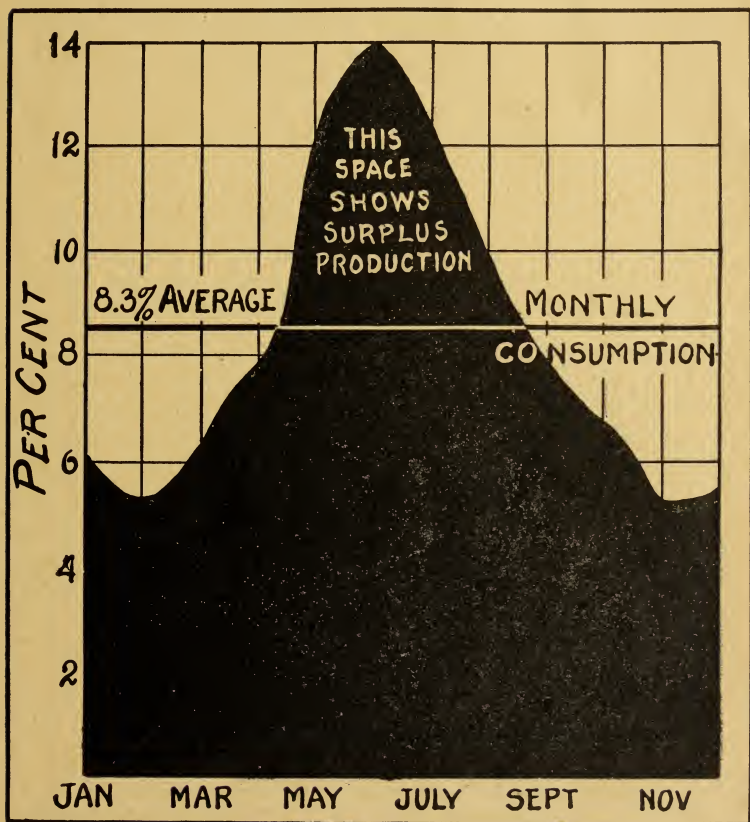


FIG. 2.—BUTTER PRODUCTION FLUCTUATES BY SEASONS.

Just as with cheese, butter production is seasonal. The area shown as surplus is the cause of low summer prices. Were this butter held by a suitable marketing federation until winter before selling, the prices would be largely stabilized.

the work of marketing satisfactorily. The only way to get better results is to consolidate in their selling so that an efficient distributing and selling organization can be established with knowledge and power to cope with nation-wide marketing problems.

MARKETING CONSISTS OF RENDERING ESSENTIAL SERVICES

Both local and federated marketing enterprises are necessary to do the work of getting products from farms to consumers. The necessary kinds of work performed in part by local units and by federated organizations are fundamental services. They are:¹

1. Assembling,
2. Grading and standardizing,
3. Packaging,
4. Processing,
5. Transporting,
6. Storing,
7. Financing,
8. Distributing.

These services are rendered in part by middlemen at local country points and in part by the larger middlemen such as railroads, wholesalers, and others and finally by relatively small middlemen known as retailers.

To a limited extent cooperative local units are the middlemen who do this work. Most of the marketing locally, however, is done by private middlemen. Regardless of whether private or cooperative, local middlemen are rendering these services. All that should be done to make marketing less expensive cannot be accomplished until specialized large scale distributing organizations are created. As a rule grading and standardizing, packaging, and processing are performed by local units. Thus, for example, oranges and potatoes are graded and packed in local packing plants and warehouses, while milk is made into cheese at local cheese factories. In contrast to these principal services rendered by the comparatively small middleman concerns locally, transporting, storing and distributing are brought about by large enterprises which cover entire states and even countries. Assembling and financing, of course, are two services rendered by all middlemen.

¹Macklin, Theodore. Efficient Marketing for Agriculture. Chaps. II-XI, inc.

MARKETING SYSTEM REQUIRES LOCAL UNITS AND FEDERATION

Because some of the work of marketing is done most cheaply by small units, it is necessary to have numerous local creameries, cheese factories, canning plants, elevators, and livestock shipping concerns. But while these enterprises are large enough to do

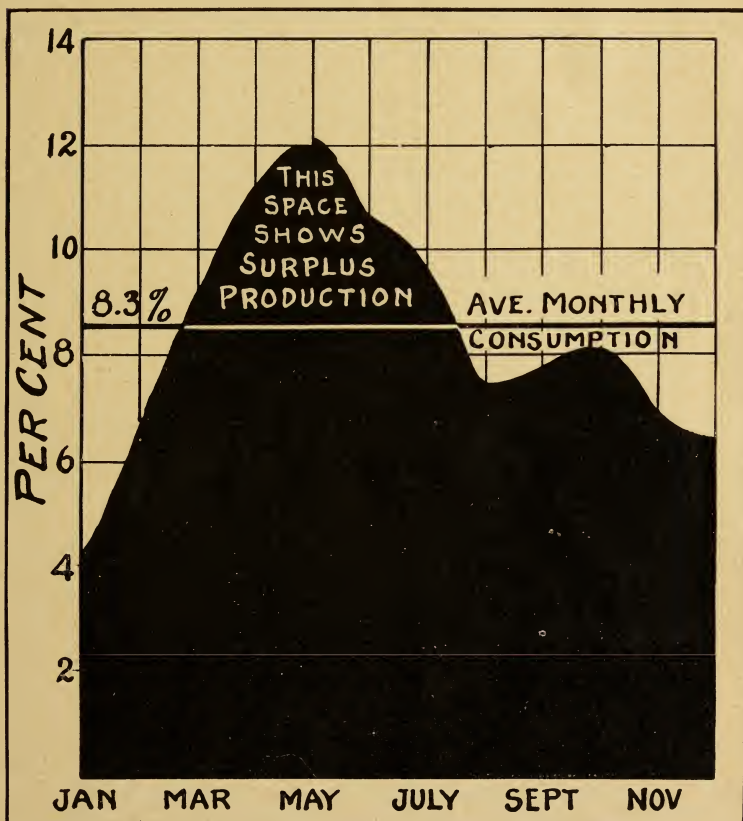


FIG. 3.—OUTPUT OF CONDENSED MILK VARIES

Just as with butter and cheese this product varies in monthly output. Prices, however, do not vary as for butter and cheese because organization has in a measure controlled distribution and stabilized prices.

part of marketing efficiently, they are wholly unadapted to doing other parts. This is particularly true in transporting, storing and distributing. To have these done inexpensively requires that a large number of local units band together in a federation to es-

establish and maintain an efficient sales or distributing agency. *Federation* is equally important for these local units if they are to cope with many other problems in the selling of farm products, such as railroad rates and services, tariffs, fair and unfair competition, inadequate and incorrect market information and reports, lack of capital, need of by-product development, the compiling and analysis of facts about the industry, legislation, advertising and other vital matters.

MUST ORGANIZE IF MARKETING IS TO IMPROVE

Efficient marketing necessitates organization because while certain services are best rendered by small local units, other services—especially those phases of storing and distributing which result in market feeding and price stabilization—can be gained only by the development of large scale federations or selling systems. If farmers want a system of improved marketing they must practice consolidation, coordination, cooperation.

Consolidation.—There should be as few local middlemen as can do the necessary work and earn profits while taking the smallest proportion of the consumer's dollar to cover their expenses and provide these profits. Since there are generally too many local middlemen, their volume of business is small and their overhead expense high. Consolidation of these concerns into a single cooperative unit or into one cooperative and one private unit is a necessary step toward reduction of marketing costs.

Coordination.—If successful local enterprises are to prevent the alternate starving and flooding of markets with consequent seasonal price fluctuation, they must coordinate all their selling activities. Particularly must they work together under a definite plan that will guarantee sufficient business for each federation to maintain a staff of experts to:

1. Collect accurate supply and demand facts;
2. Store the surplus seasonal production for sale in seasons of deficit production;
3. Advertise branded products which have been rigidly graded and represent standardized dependable quality;

4. Feed markets and thus stabilize prices so that farmers may be protected against the hazards of price fluctuation.

These hazards now seriously affect productive operations and interfere with the maintenance of satisfactory conditions in rural life.

Cooperation.—The profits or savings which a consolidated, coordinated marketing system may obtain shall be paid to those who have toiled to produce the products. It guarantees to the farmer that if profits are made by the marketing system over and above the prices paid, that these shall go to him. This amounts to getting a higher price for his goods. It means, moreover, that to the extent prices are stabilized and profits made, the farmer will have effectively reduced the cost of marketing while also getting a higher proportion of the consumer's dollar.

"GET TOGETHER" MARKET CONFERENCE FORMULATES PLAN OF ACTION

A state-wide marketing conference was held at the Agricultural College at Madison, February 1 to 10, 1921. This was called by the Governor of Wisconsin, acting on the advice of the various farmers' organizations of the state and of middlemen engaged in the actual marketing of farm products, together with the various state departments of research, extension and control. Separate committees were selected to study the marketing of various farm products and instructed to formulate plans for improvement in the marketing of each one of these commodities. Each of these committees was composed of some of the ablest men engaged in the production, handling, storing, manufacturing and distributing of certain Wisconsin products. Each member was intimately familiar with the details of handling the product in his particular field. As a result of the deliberations of these committees, recommendations were drawn up and adopted by the conference dealing with the marketing of purebred livestock, meat animals, cheese, butter, milk, wool, sugar beets, potatoes, and canned peas. Each of these sets of separate recommendations is briefly set forth as adopted together with the names of the men forming the respective committees.

MARKETING OF PURE BRED LIVESTOCK

We recommend: (1) That the Wisconsin Live Stock Breeders' Association, through its officers, call a meeting to be comprised of a representative from each state association with the object of drawing up

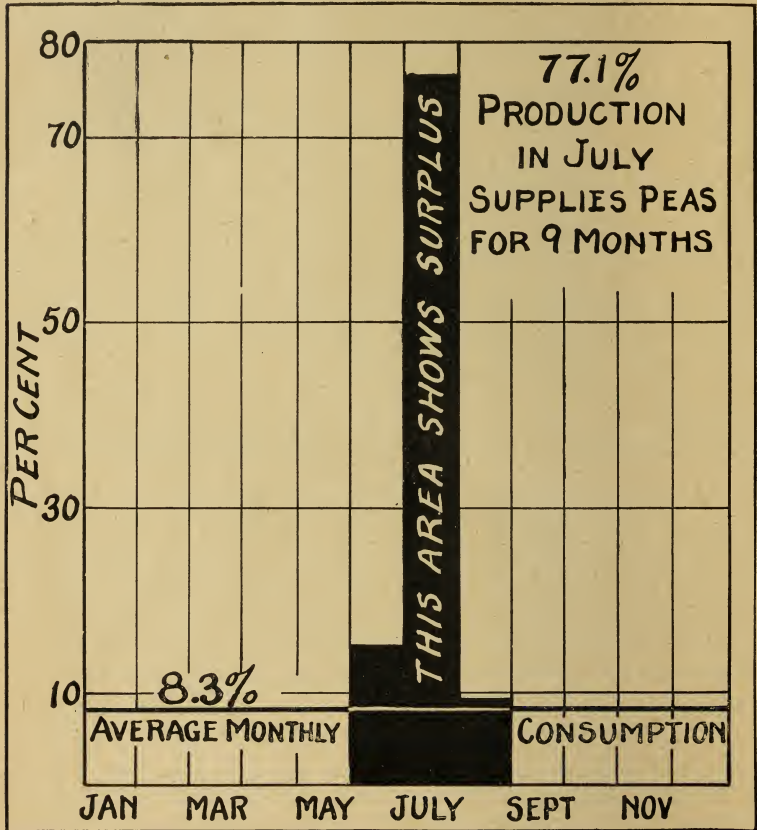


FIG. 4.—PEA PRODUCTION ENTIRELY SEASONAL

Few products are matured in such a short season as peas for canning purposes. Were it not for organization most of the crop would have no value at all. Price stabilization has been realized to a great extent by relatively efficient distribution of the finished product.

forms of sales agreements which make plain the terms of sale to both buyer and seller.

(2) That all sale catalogues state fully and plainly the conditions of sale.

Committee:

A. T. Plowman, Farmer, Marathon County

H. W. Griswold, Sec'y Western Guernsey Cattle Club

Wm. F. Renk, Wisconsin Sheep Breeders' Association

MARKETING OF MEAT ANIMALS

We recommend: (1) The organization and maintenance of a cooperative livestock shipping association at every local shipping point having sufficient tributary territory to assure success; said local association to be composed of the livestock producers in the locality and governed by its members excepting in such matters as may be covered by contract with the central marketing association.

(2) The federation of these local shipping associations into state central marketing associations either directly or through intermediary county organizations; these state central associations to be incorporated under cooperative laws with or without capital stock and to accept membership only from local shipping associations or county associations composed of local associations.

(3) The federation of these state associations for the purpose of deciding on and carrying out additional steps that may be taken to improve methods and conditions in terminal markets.

(4) That all farm organizations, and state agencies dealing with marketing, cooperate in the promotion of this marketing organization.

(5) That contracts between the members and their associations be made in order to solidify the whole cooperative marketing organization.

Committee:

J. Fred Larson, Wisconsin Cooperative Livestock Marketing Association, Chairman
B. H. Hibbard, College of Agriculture
Ben Lang, Farmer, Marshfield
L. Spencer, Commission Man, Milwaukee

MARKETING CHEESE

We recommend the extension of the work of the Wisconsin Cheese Producers' Federation and the development of Wisconsin Foreign Cheese Federation along similar lines.

Committee:

Math. Michels, Wisconsin Division of Markets, Chairman
R. R. Runke, Fond du Lac County Farm Bureau Agent
R. J. Paulson, Dairy Farmer, Riley, Wisconsin
W. C. Brill, Wisconsin Cheese Producers' Federation.

MARKETING BUTTER

We recommend: (1) That a general meeting of all parties interested in the welfare of a number of creameries in a given territory be called at some appointed time.

(a) A meeting of this kind should be well advertised and talked about for some time before the appointed date.

(b) The managers, directors, and patrons of the creameries interested in such a movement should be informed at this meeting of the

prices received for butter and the prices paid for equipment and supplies by the different creameries.

(c) An explanation should be made of the possibility of reducing the cost of gathering milk and cream when one wagon covers a given territory.

(d) Attention should be called to the importance of pasteurization of cream at the creamery and of cream-cooling tanks at the farms.

(e) A report may be made on the saving in freight when butter is sold in carload lots, as compared with shipments of less than this amount.

(2) After discussion of the points mentioned and any others that may come up at this general meeting, an organization committee should be appointed for the purpose of collecting information that will be helpful in determining the best course to pursue in order to accomplish the desired results.

(a) At a later meeting, this organization committee should report on the advisability of employing a field man who is competent to direct the standardization of the methods of buttermaking at the different creameries, and to advise the farmers in regard to the care of milk and cream on the farms.

(b) The committee will determine the basis on which the necessary funds for employing a field man shall be raised.

(c) The committee shall make a detailed report of its recommendations and suggest ways and means of carrying out the plans suggested at a later meeting of all parties interested in such a creamery league.

(d) Any creamery in the state may have its butter regularly inspected by a state official who has been specially trained for this work.

(e) Each shipment of butter from a creamery shall be stamped or branded by this official either at some grading station to which the butter is regularly shipped or at the creamery.

(f) The specifications for the different grades of Wisconsin butter shall be supplied by a committee selected for this purpose.

(g) Each official butter grader must secure a license which will be issued after passing a satisfactory examination.

Committee:

E. H. Farrington, College of Agriculture, Chairman
H. C. Larsen, Sec'y Wisconsin Butter Makers' Association
Mrs. L. Mattson, Sec'y and Treas. Wis. Coop. Creameries Association
Math. Michels, Wisconsin Division of Markets
Hon. Geo. Nelson, United Creamery Federation
Herman Ihde, Master of the State Grange

MARKETING MILK

We recommend: (1) That milk producers normally furnishing the same local or community markets be organized to obtain facts concern-

ing milk production, improvement of quality, conditions of manufacturing or distributing and such other economic understanding as will impress both parties with their mutual problems and responsibilities.

(2) That each local milk producer's association maintain a relations committee to meet with a similar committee appointed by the agency to whom milk is sold, for the purpose of providing at all times a sympathetic point of contact and a direct means of approaching and considering each others problems.

(3) That each local producers' association maintain a standing committee to study the relative merits of the various existing or prospect market outlets for milk, and to foster the establishment of cooperative enterprises for the manufacture of dairy products whenever and wherever conditions warrant or demand such action, keeping in mind the education of all concerned upon the following:

A—Lowering the cost of manufacturing and distributing milk or its products

B—Lowering the cost of producing whole milk

C—Cow-testing associations

D—Improving the quality of raw milk and its finished products

E—Fundamental principles of economics as applied to production and to marketing

(4) That to further the organization of these local associations and to enable them to be helpful to each other by interchange of information, experience, and by comparison, a Wisconsin Federation of local milk producers associations be established and vigorously promoted.

(5) That the members of all branches of the dairy industry shall support the Wisconsin Dairy Council in its campaign of education and advertising. In the end this will result in a better understanding by consumers in both city and country that milk and other dairy products are absolutely necessary in the daily diet if we are to continue as a nation of strong, healthy, vigorous men, women, and children. Not only this, but also that they may realize that these products are the best foods, are relatively cheap in price, and are delightfully palatable.

(6) That there should be established a state committee on milk marketing that will be properly representative of the producers, consumers, manufacturers, and distributors of the various dairy products, as well as social welfare workers, the agricultural and city press, and such technical investigators and state or city departments as are directly concerned with the products in question. Such committee should meet at least once each year and oftener whenever it is felt that its deliberations will benefit the industry.

Committee:

Paul C. Burchard, Sec'y Wisconsin Dairymen's Association, chairman

John LeFeber, Manager Gridley Dairy Company

Math. Michels, Wisconsin Division of Markets

G. R. Rice, Sec'y Milwaukee Milk Producers' Association

E. C. Pommerening, President, Wisconsin Society of Equity

George W. Hull, President, Wisconsin Farm Bureau Federation

A. E. Hanson, Wisconsin Manager for Libby-McNeil Company

POTATO MARKETING

We recommend: (1) That the cooperative potato marketing and warehouse associations or companies of Wisconsin establish a cooperative potato marketing federation as a means of creating an efficient central state wide cooperative selling agency through which Wisconsin potatoes may be more efficiently fed to the markets of the country.

(2) That all farmers' cooperative and state agencies be urged to promote the establishment of this federation.

Committee:

M. D. Campbell, Produce Committee, American Society of Equity,
Chairman
J. F. Jardine, Potato Shipper, Waupaca, Wis.
J. G. Milward, Sec'y Wisconsin Potato Growers' Association
W. P. Jones, Wisconsin Division of Markets
Karl Hazelberg, Seed Potato Growers' Association
Albert C. Ficks, Cooperative Warehouse Operator
Chas. A. Peterson, Sec'y, Wisconsin Farm Bureau Federation

MARKETING CANNING PEAS

We recommend that the Wisconsin Canning Crop Growers' Association be perfected to carry out the following resolutions:

(1) That a relations committee of three growers representing the canners, be established in each community where peas are grown and canned.

(2) That the pea growers of each community and the canner mutually assume the responsibility of organizing an annual conference at which the whole problem of growing peas, canning them, and marketing the same, be fully covered so that all parties will understand more fully each others problems and responsibilities.

(3) That because pea canners differ greatly in operating efficiency and are located in separate sections where customary arrangements are vital to the quality of finished products, and because unsettled market conditions make a prediction of future prices uncertain, let all matters relating to price and method of buying be left for adjustment between the growers and canners of each locality.

Committee:

Moulton B. Goff, Chairman Growers and Packers
W. P. Jones, Wisconsin Division of Markets
E. C. Nitschke, President Dodge County Pea Growers' Association
R. E. Vaughn, College of Agriculture
Theodore Macklin, College of Agriculture
J. A. Hageman, Sec'y Wisconsin Pea Canners Association
Walter Schroder, Manager Wisconsin Canning Company

WOOL MARKETING

We recommend that all wools be pooled in centrally located warehouses under a national selling agency; to sell direct to manufacturers after wools have been properly graded.

Committee:

Geo. McKerrow, Wisconsin Fleece Wool Growers' Association
L. G. Foster, Wisconsin Division of Markets
Jas. Dillon, Wool Grower, Mondovi, Wisconsin
J. J. Phoenix, President Bradley Knitting Company
W. F. Renk, Secretary Wisconsin Sheep Breeders' Association

SUGAR BEET MARKETING

We recommend: (1) That contracts between sugar beet companies and farmers be standardized to provide that prices paid for beets shall be based on a sliding scale set in accordance with the price of sugar.

(2) That a protective tariff be established by congress to encourage the sugar beet industry in the United States.

Committee:

A. H. Wright, College of Agriculture, Chairman
James Clemmons, Kansasville, Wisconsin, American Society of Equity
H. J. Grell, Johnsons Creek, Wisconsin
J. S. Lawson, United States Sugar Company, Milwaukee, Wisconsin
C. P. Norgord, Commissioner of Agriculture, Wisconsin.

POINTS OF COMMON INTEREST

In these recommendations three fundamental needs stand out conspicuously:

1. Strong overhead sales organizations are essential;
2. More adequate storage facilities are needed;
3. Improved financing methods and more capital are imperative.

Since these needs cannot be secured by local marketing enterprises individually and still less by farmers working alone the outstanding thing is that organization is essential.

ORGANIZATION ESSENTIAL TO MARKETING IMPROVEMENT

By developing and perfecting marketing organizations the following advantages may be gained which make marketing more efficient and less costly.

Local commodity enterprises are consolidated.

Each concern doing business is developed to a size and an efficiency that enables it to render essential marketing services at minimum cost and hence handle products for a smaller portion of the consumer's dollar.

Local units are enabled by federated organizations to gain benefits because the system thus made is large enough to feed markets and stabilize prices, so far as this is economically and competitively possible, by:

Building up adequate financing arrangements;

Storing seasonal surplus for sale in deficit producing periods;

Obtaining adequate supply and demand facts concerning markets the country over;

Providing necessary and adequate connections through which products may be sold constantly;

Advertising to expand markets and to create or engage the stable consumer demand;

Placing adequate premiums upon quality production to guarantee consumers a supply of what they want, and farmers the best obtainable returns for their efforts..

While many important benefits may be derived from efficient marketing organization it should be fully realized that organization can accomplish some things and not others. Some farmers hold that because it costs them a certain figure to produce a given product, prices should therefore be high enough at least to cover this cost with a profit besides if possible. Others, such as the members of farmers' marketing federations in California, have learned by experience that it is more practical to go after the highest stabilized prices that the markets will afford. Then, when the best prices obtainable are too low to cover costs and provide a profit, they change production to other lines where prices are remunerative.

Farmers, therefore, should devote their energies to creating actual organizations that will distribute products, stabilize prices, and offer goods and services to consumers under improved conditions. In this way Wisconsin farmers can actually stabilize prices and secure a higher proportion of what the consumer pays.

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of the University of Wisconsin, K. L. Hatch, assistant di-
rector, the United States Department of Agriculture cooperating.

Why is agriculture "our basic industry"? Because it furnishes over four-fifths of the nation's total supply of raw material, the life blood of industry. If this basic industry is to be maintained, FARMING MUST BE MADE TO PAY, not by exacting higher prices from the consumer but by organization which will secure for the farmer a larger share. More economical production is possible, but there is far too much waste in the distribution of farm products. Small, unfederated units, competing against each other for local markets, burdened by unnecessary overhead charges, more or less ignorant of market conditions and market demands are inefficient and expensive. Industry found this out forty years ago and the consolidation of industrial enterprises became so rapid, and so great was the danger of possible monopoly, that Congress passed the "Anti-Trust Law" which still stands as a guide and a warning to those who, by this means, would stifle competition.

Agriculture today is following the proven example of industry. But if agriculture is to consolidate and extend its business enterprises it must not overlook the problems and responsibilities that surely follow. It must be careful to provide for at least four things that are essential to business success:

Adequate capital.

Efficient and loyal labor.

Intelligent and trained executive management.

A product whose quality, quantity, and kind can meet competitive conditions and market demands.

Given these four things and conforming to other necessary conditions there is no reason why agriculture cannot and will not, by persistent effort, throughout a series of years, finally succeed in placing its products in the hands of the ultimate consumer with increased satisfaction to him while at the same time claiming for the farmer a much larger part of the price which the consumer has to pay.

By these means farming, the nation's basic industry, can be made profitable.

K. L. HATCH.

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JAN 11 1922

It Pays to Use A Good Ram



EXTENSION SERVICE OF THE COLLEGE OF AGRICULTURE
THE UNIVERSITY OF WISCONSIN
MADISON

HOW TO SUCCEED WITH SHEEP. 1. Use good purebred rams. 2. Select young ewes. Yearlings, two-year-olds, or perhaps three-year-olds are far more desirable for starting a flock than older ones. 3. Discard broken-mouthed ewes and ewes with bad udders. 4. Choose ewes having good size, desirable forms and dense fleeces. 5. Feed lambs especially well throughout the first year because a sheep makes its greatest growth during this period. 6. Give the flock good care throughout the entire year.

It Pays to Use a Good Ram

FRANK KLEINHEINZ AND G. C. HUMPHREY

IN SPITE of the seemingly discouraging prospects for the sheep industry, now is a good time to start a small flock of sheep or to improve the flock already established.

Periods of depression rather than boom-times offer the best chances to start in sheep production as well as in the production of any other class of livestock.

Sheep raisers in common with other producers have been experiencing in recent years losses that have been very discouraging. As a result, many flocks have been greatly reduced and many others entirely discontinued.

Men well posted upon the sheep industry of the United States feel that we have now passed through the valley of depression and are moving in the direction of more normal and stable conditions. The mills are getting back to work and through co-operation and federation better systems of marketing are being worked out.

There is reason to believe that the sheep industry of the frontiers of the world has reached its maximum and is now on the decline. If this is the case, it will mean that we must look more and more to other sections for the production of both wool and mutton.

However, if sheep husbandry is to be made profitable on the higher-priced lands it will be necessary to raise only the type of sheep which are capable of converting feeds economically into wool and mutton. To secure flocks well adapted to an intensive and efficient agriculture, we must use rams capable of improving and increasing the wool and mutton production of our flocks.

The natural advantages of sheep on the farm are too well known to require mention. It is generally appreciated that well-managed flocks return to their owners in normal times good incomes on comparatively small investments. Sheep eradicate weeds, help greatly to keep up soil fertility, require inexpensive buildings and necessitate a minimum amount of labor.

The agricultural colleges and experiment stations are frequently called upon to demonstrate a practical and economical method of improving flocks. These institutions have been invited to make such demonstrations at important expositions like the International Livestock Show. The College of Agriculture of the University of Wisconsin has frequently exhibited the results of the



FIG. 1.—A GOOD RAM IS MORE THAN HALF THE FLOCK

A low-down, broad, blocky ram with straight top and bottom lines, thick, short neck, broad masculine head and bold eyes is essential to a good flock. An inferior ram makes no improvement in any flock.

work which has been carried on for the benefit of Wisconsin students and farmers interested in starting flocks of sheep at a comparatively low cost. The sheep which have been exhibited in these demonstrations have been obtained by mating good western ranch ewes with pure-bred rams.

While the accompanying illustrations show the result of South-down breeding, other breeds have also been used successfully.

WESTERN RANGE EWES FOR FOUNDATION STOCK

Range ewes which, as a rule, are hardy and cost less than native ewes, were selected for the foundation of the college flock of cross-bred sheep. The ewes were selected with care and with the thought that young ewes, yearlings, two-year-olds, or perhaps

three-year-olds, are far more desirable for starting a flock than older ones. Broken-mouthed ewes have always been discarded. Ewes have been examined before purchase to insure their udders being in good condition. The importance of selecting a class of sheep that is healthy and vigorous has always been recognized.



FIG. 2.—WESTERN RANGE EWES

These western range ewes are the mothers of the first cross yearlings and lambs shown in Figures 4, 5 and 6.

Where they are to pasture on brush land, ewes with close, dense fleeces are preferable to the loose, open-wool kind because the latter loses too much wool on the brush.

The three western ewes shown in Figure 2 are of the desirable type for a foundation flock. These ewes were some of the original foundation flock from which the cross breds, discussed in this circular, were produced. The original ewes were bought on the Chicago market when they were lambs. The three ewes shown in Figure 2 weighed 143 pounds in November, 1918, at 8 years of age. Their average wool clip for that year was 8.2 pounds and they had produced 37 lambs during their lifetime.

SELECTION OF THE RAM

In raising sheep for mutton it is highly important at all times to select and invest in a good ram of one of the mutton breeds. The value of a good ram is clearly demonstrated when it is mated with a class of common range ewes. The lambs from range ewes get their superior mutton qualities and high market value—determined by the butcher's requirements—largely from the sire. They also may get their increased wool production from this source. The best rams that can be bought are always the best investment.

This is proved by the increased weight and better quality of lambs secured from such sires as contrasted with what it is possible to get from common or inferior rams. The Southdown ram in Fig-



FIG. 3.—PUREBRED SOUTHDOWN RAM

This ram is the sire of the yearlings and lambs shown in Figures 4, 5, 6 and 7.

ure 3 is the sire which was used in getting the results herewith shown. His lambs prove him to be an excellent breeder.

FIRST CROSS YEARLING EWES

The yearling ewes shown in Figure 4 are the result of mating the purebred Southdown ram (Fig. 3) with the common range ewes shown in Figure 2. The improvement in mutton form of the yearling ewes over their mother is very apparent. These ewes were shown as a pen of three lambs at the International Live Stock Exposition of 1917 in the special mutton improvement classes, and won second prize. In 1918, they were again shown as a pen of yearlings at that show and were awarded first prize.

Their average weight was 170 pounds and their wool clip in the spring of 1918 averaged 11.4 pounds. That they are a profitable class of sheep for the farmer is unquestioned, especially considering the fact that they had only ordinary pasture throughout the



FIG. 4.—PRIZE-WINNERS AT 1918 INTERNATIONAL LIVE STOCK EXPOSITION

These are first cross Southdown western yearling ewes out of the western range ewes (Fig. 2) and by the purebred Southdown ram (Fig. 3). This pen won first prize in the college demonstration class.

grazing season and were fed only a pound of grain a head daily for five weeks in the fall previous to the show. The grain mixture supplied these yearling ewes consisted of one part oats, one part wheat bran and one part corn. In addition to the grain, they had clover hay and roots. When comparing these strong, vigor-



FIG. 5.—FIRST CROSS WESTERN EWE LAMBS

These lambs are out of western range ewes (Fig. 2) and by the purebred Southdown ram (Fig. 3). This pen also won first prize in college demonstration classes at the 1918 International Live Stock Exposition.

ous, broad-backed, yearling ewes with the narrow, wedge-shaped forms of their mothers, one is impressed with the importance of using a good purebred sire.

FIRST CROSS WESTERN EWE LAMBS

The pen of first cross western ewe lambs (Fig. 5) won the first prize in the mutton improvement classes at the 1918 Inter-

national. These lambs, like the yearling ewes, were the first cross from the old western ewes in Figure 2 and by the same sire as those in Figure 4, being a year younger. At the age of 8 months, their average weight was 115 pounds. Besides pasture with some rape, these lambs received $\frac{1}{4}$ pound of grain mixture a head daily

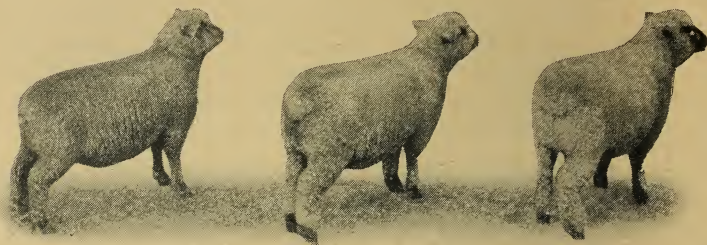


FIG. 6.—MORE PRIZE-WINNING LAMBS

These first cross Southdown western wether lambs out of western range ewes (Fig. 2) and by purebred Southdown ram (Fig. 3) won first place in the college demonstration classes in the 1918 International Live Stock Exposition.

—consisting of equal parts of bran, barley and whole oats—from the time they commenced eating. After October 12, when the weather became cooler, a small amount of cracked corn was added to the grain mixture. Clover and alfalfa hay and some roots and



FIG. 7.—SECOND CROSS WETHER LAMBS

These lambs are out of the first cross Southdown western ewes and by the purebred Southdown ram (Fig. 3). This is a first prize pen. The lamb at the right was champion over all lambs shown in the college classes.

cabbage were also fed to them. A sheep makes the greatest growth in the first year of its life; and it is therefore important to feed the lambs well throughout this period, in order to build up and maintain a strong, large-sized, heavy-shearing flock.

FIRST CROSS SOUTHDOWN WESTERN WETHER LAMBS

The pen of first cross wether lambs (Fig. 6), also won first prize in the college mutton improvement class at the 1918 Inter-

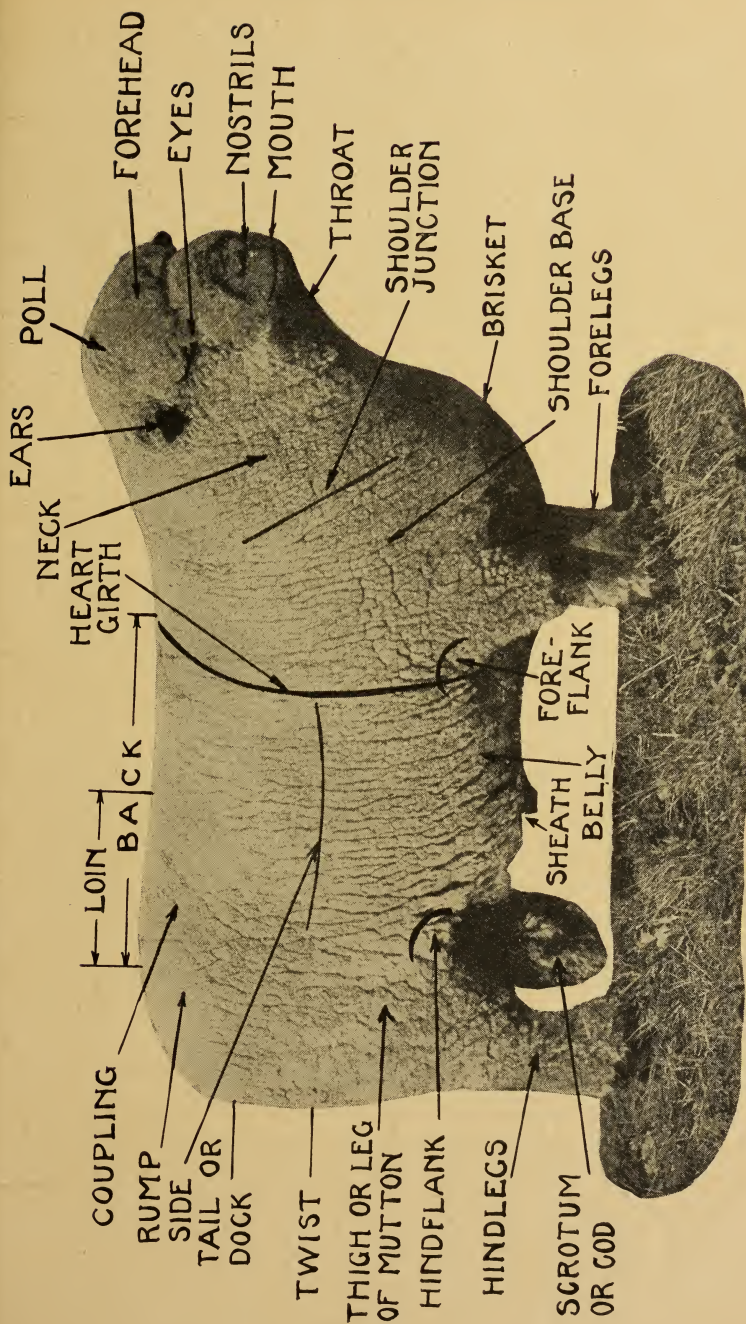


FIG. 8.—THE PARTS OF A MUTTON RAM
A full development and a proper blending of the parts named indicate a good mutton ram.

national and third prize in a class open to all exhibitors. These lambs were twins with the first cross ewe lambs, were fed the same rations, and happened to be of the same weight as their sisters at the time of the show.

SECOND CROSS SOUTHDOWN WESTERN WETHER LAMBS

The lambs shown in Figure 7 were the offspring of first cross ewes and are grandsons of the western range ewes, Figure 2. They were awarded first prize in their class for mutton improvement in 1918. They were also sired by the Southdown ram shown in Figure 3, whose excellent qualities seemed to justify one instance of inbreeding and which apparently was successful. Their age, feed, care and management was the same as that of the lambs shown in Figures 5 and 6. Their average weight at 8 months of age was 110 pounds, being 5 pounds less than that of the first cross lambs. It was noticeable that their fleeces were somewhat shorter than those of the first cross. They also possessed more of the Southdown compactness of mutton form. The lamb at the right in Figure 7 was declared champion of all lambs shown by agricultural colleges in the contest of 1918.

WHAT THIS DEMONSTRATION TEACHES

A high-class flock of sheep may be established by securing a good grade of western range ewes and an excellent purebred ram of one of the mutton breeds. The investment in such a class of ewes will be comparatively small. One should pay a price that is sufficient to buy a good purebred mutton ram. Nothing is gained or saved by buying a ram of poor or of secondary grade. The ram should be judged on his individuality. His development should be full and all his parts should blend. Moreover, he should be well bred because it pays to buy a ram from a well-bred flock. The demonstration also shows that a marked improvement in mutton forms is secured in the first and second crosses. If a heavier shearing sheep and larger carcass is desired than that shown in this demonstration, heavier fleeced and large rams of other mutton breeds may be used. In producing the highest type of mutton sheep from western range ewes, a short-legged, broad-backed, blocky-formed type of ram should be carefully selected to overcome the more rangy type of the western ewes.

Good care, feeding and management must accompany good breeding. The size, finished condition, and weight and quality of

fleece produced in the first and second crosses resulting from western range ewes and the purebred Southdown ram in this demonstration, were secured by giving them access at all times to good feed, including pasture and rations similar to those mentioned. The lambs were castrated and docked at the proper age and also were given proper attention in all the details that result in best growth and development. The beginner who makes a moderate investment in western ewes and a good ram can easily find the time necessary to give proper attention to developing a flock that will be highly satisfactory and profitable.

To Protect the Flock

Keep sheep off low, wet land.

Provide shelter in winter and shade in summer.

Guard against dogs and predatory animals.

Change pastures as often as possible.

Supply pure fresh water and salt in both summer and winter.

Exercise pregnant ewes whenever weather permits.

Dip the whole flock at least once a year to keep it free from ticks and lice.

Avoid feeding timothy hay.

Feed roots or silage in addition to clover, alfalfa, or a similar kind of hay. Limit the quantity of roots or silage to two pounds for pregnant ewes.

Never feed frozen silage or spoiled roots.

Gradually accustom sheep to alfalfa and clover pasture to avoid bloat.

Milk Drinks for Everybody



EXTENSION SERVICE OF THE COLLEGE OF AGRICULTURE
THE UNIVERSITY OF WISCONSIN
MADISON

Milk Drinks for Everybody

J. L. SAMMIS



MILK drinks, made from the main product of Wisconsin farms, contain food elements necessary for the health, growth and strength of children. If the nickles and dimes now spent by children for soft drinks with little or no food value were used instead to buy wholesome milk drinks, the health of the coming generation would be greatly improved. Many children refuse to drink plain milk but will thoroughly enjoy the sweetened, flavored milk drink.

“Milk Drinks for Everybody” should be our slogan. Make them at home or order them at the fountain. Milk drinks can be made in a minute out of fresh whole milk, powdered whole milk or condensed milk.

Flavors of many varieties are used. Ordinary household flavoring extracts, soda fountain syrups, juices from fresh or canned fruit or home-made fruit syrups may be used.

HOME MADE MILK DRINKS

1. **Flavor.** Put a few drops of any good flavoring extract in a glass. (A few trials will show exactly how much to use.)
2. **Sugar.** Add two teaspoonfuls of sugar.
3. **Milk.** Fill the glass with cold milk. Add a little ice if you have it. The colder the drink, the better you will like it.

This milk drink combines the food value of milk with the great variety of flavors which the housewife has in the pantry or can buy.

If fresh whole milk is not handy at any time when you want a milk drink, use condensed or powdered milk instead. To the flavor and sugar add a half glassful of condensed milk and fill the glass with ice water.

If you do not like the flavor of condensed milk, use whole milk powder, as this is entirely free from cooked flavor. It can be bought in tin cans at first-class grocery stores; and will not spoil if the lid is kept on the can to exclude dampness.

Add a heaping tablespoonful of whole milk powder (one ounce) to the sugar and flavoring in the glass. Then use a narrow egg beater to stir the mixture for half a minute, adding a little water if needed. Fill the glass with cold water and stir thoroughly with a spoon to mix the flavor. A little ice improves the drink.

Variations. A little nutmeg or cinnamon sprinkled over top of any of these drinks makes them even more appetizing. A dash of whipped cream with a cherry or a few nuts on top is a delicious addition. If almond flavoring is used a piquant "Macaroon Milk" may be made by sifting crushed macaroons over the top of the milk.

FOUNTAIN MILK DRINKS

1. **Flavor and Sugar.** At the fountain both the sugar and flavor are contained in the "syrups". About an ounce of syrup is put in a glass.

2. **Milk.** Whole milk, condensed milk, or whole milk powder is added to the syrup and mixed thoroughly. (The narrow egg beater will fit into an ordinary soda glass.) The glass is then filled with carbonated water in place of ice water.

The ordinary soda is a water drink containing flavor and sugar in addition to carbonated water. The new "milk soda" has all the food value of fresh whole milk and is a body-builder as well as a delicious and attractive delicacy.

The addition of whole milk powder to any soda gives it a rich creamy taste and slightly softens the sharpness of the carbonated water flavor.

Whole milk powder is especially well suited for use at the fountain because it keeps perfectly well after the can is opened if the lid is kept on. Moreover, it is always ready for use, while fresh milk if purchased daily for fountain use may be all used up or else may be left over to spoil.

Pronounced flavors such as lemon, vanilla, strawberry, root beer, ginger, mint and sarsaparilla are good. Many pleasing flavor combinations are possible.

Fancy names help to sell milk drinks. Holstein Highball, Jersey Julep, Ayrshire Ale, Guernsey Flip, and many others will suggest themselves to the resourceful soda fountain man.

Hot Milk Drinks. Instead of having plain coffee every morning for breakfast, try serving "Cafe au Lait" occasionally. This is made by adding 5 cups of hot milk to $1\frac{1}{2}$ cups of coffee made four times the usual strength.

Hot cocoa or chocolate, made with plenty of rich milk and topped with whipped cream or beaten white of egg, is good for breakfast or lunch.

Other appetizing and nutritious milk drinks are:

Spiced Milk

Mix 2 tablespoons of powdered whole milk, 1 teaspoon of sugar, 2 tablespoons of cold water, and $\frac{1}{4}$ saltspoon each of nutmeg, clove, and cinnamon. Add $\frac{1}{2}$ cup boiling water, beat until smooth and serve hot.

Eggnog

Mix 2 level tablespoons of powdered whole milk, 1 teaspoon sugar, $\frac{1}{4}$ saltspoon nutmeg, 1 tablespoon water, and 1 saltspoon vanilla. Add a beaten egg and $\frac{1}{2}$ cup of hot water. Beat the mixture thoroughly before serving.

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Farm Butchering and Curing of Pork



EXTENSION SERVICE OF THE COLLEGE OF AGRICULTURE

THE UNIVERSITY OF WISCONSIN

MADISON

A PRACTICAL WAY

for the farmer to cut down his meat bill is to butcher enough of his own hogs to supply himself with fresh pork and pork products.

Early winter is the best time for home butchering because the spring pigs are ready to kill and farm work is less pressing. Most important, the meat is more easily preserved in either the fresh or the cured state.

Variety for the different meals can be obtained by canning fresh pork and by making various kinds of sausage, head cheese and scrapple.

Soap and lard are two valuable products that can be made when the hogs are butchered at home.

Farm Butchering and Curing of Pork

ANIMAL HUSBANDRY AND HOME ECONOMICS DEPARTMENT

The relatively high prices for fresh and cured pork which the consumer is called upon to pay at the present time in comparison with the price for the live hog clearly show the need for a wider practice of home butchering and curing of pork.

Winter is the most satisfactory time for butchering because spring pigs are usually in best condition for slaughter at this season and farm work is less pressing. Most important, the meat is more easily preserved in either the fresh or cured state.

Killing the Hogs. It is best to limit the feed of the animals for at least 18 hours before butchering, and to keep them quiet just previous to it. Although some people prefer stunning the animals by shooting or knocking, nevertheless, better bleeding is effected where the animal is stuck without previous stunning. To do this, put the animal on its back and stand astride its body, holding its front feet. The other person who is to do the sticking should stand in front of the pig, hold down its lower jaw with his left hand and thrust the knife about five inches deep just in front of the breast bone, holding the knife at an angle of about 30 degrees, or pointing it toward the root of the tail. To get rapid and thorough bleeding, hang the animal by its hind feet.

Scalding and Scraping. A barrel about one-third full of scalding water and braced at an angle against a platform on which the men may stand, is good for scalding. Two men will have little difficulty in lowering the carcass of an 8-months-old pig, butt first, and then head first into the barrel, agitating the carcass at the same time. Care should be taken not to have the water too hot, because the bristles are likely to "set". A temperature of 160 degrees Fahrenheit is about right. Some wood ashes or lye put into the water helps in removing the scurf and makes scraping easier. A large knife is good for scraping.

Opening the Carcass. Before removing the bowels, the carcass is hung by a gambrel stick forced at each end between

the tendons and the phalangeal bones of the hind legs. With the carcass suspended at a proper height, the first step in removing the offal usually is to make a deep cut with a knife between the hind legs. Then cut all around the rectum so as to detach it from the carcass proper and have it stay with the offal. The knife may then be drawn midway down the abdominal wall to the lower jaw, taking care that none of the intestines are cut.



FIG. 1—SCALDING THE HOG

A barrel braced against a platform may be used for scalding.

Emptying the Carcass. The entrails, loosened at the rectum, are then brought down. The operator rests them on his arm as he proceeds and drops them into a convenient receptacle when they are free. From the entrails are removed the heart and liver but care must be taken that the gall bladder is pulled away from the liver. Other parts to be saved are the throat,

stomach, sweetbreads, and, in many cases, the lungs and kidneys. The tongue may be removed with the offal if the muscles on either side of the tongue are cut.

The gut fat, after its removal from the bowels, should be soaked over night in water and washed well the next day before being rendered.

If sausages are to be made, the small intestines are frequently used for casings. Prepared casings, however, may be bought cheaply.

The leaf lard is generally left to hang over night attached to



FIG. 2—REMOVING THE HAIR
Scrape the feet and the head first.

the carcass. Care should be taken to sever all but its upper end from the carcass proper before it becomes chilled and rigid.

The entire carcass should be rinsed thoroughly with clear cold water and a spread stick placed between the sides of the belly before the carcass is left to hang.

Cutting up the Carcass. After letting the carcass chill for about 24 hours, the spread stick is removed and the sides separated from each other in a line midway down the spinal column. A saw is often used to start this process on the upper or hind



FIG. 3.—REMOVING THE ENTRAILS
In opening the pig, be careful not to cut the intestines.

end, but an axe is better for the major part of the job. The two sides are then taken down and usually cut into ham, fat back, loin, side, spare ribs, shoulder, head and feet.

The ham is the first to be removed; and if it is to be cured and smoked, trim and round it out neatly. The shoulder is removed by severing the head from the carcass just back of the ear, and then cutting through between the second and third rib or one or two ribs farther down the body as desired. If shoulders are to be cured, they require much more trimming than hams. The upper part of the shoulders is known as "clear plate" and "Boston butt", the lower part as "picnic ham."

The loin is separated from the side or belly by sawing through the ribs about four inches below and parallel with the back bone. The spare ribs are removed from the side, which is then trimmed and ready to be cured into bacon.

The fat back is removed from the loin by means of a sharp knife. The "clear plate" is also cut from the shoulder butt leaving the "Boston butt."

The next process is to trim all rough and hanging pieces saving them either for canning, sausage or soup. All fat trimmings or leaf fat should be saved and rendered after they are thoroughly cooled. All fat taken from the gut should be kept separate, as it may give an offensive odor to the rendered fat.

SALTING MEATS

In cold weather, 24 to 36 hours after killing is the proper time to begin salting. Curing agents are salt, saltpeter, sugar, and sometimes molasses.

Rub the surface of each piece of meat with salt and allow the meat to drain over night. In the morning pack the pieces of meat with the meat side up (except the pieces in the top layer) in a clean barrel tight enough to prevent leakage. (A molasses or syrup barrel may be used. A vinegar barrel should be burned on the inside before it is used.) In filling the barrel put the ham on the bottom, the shoulder next, and let the bacon and smaller cuts fill in the spaces.

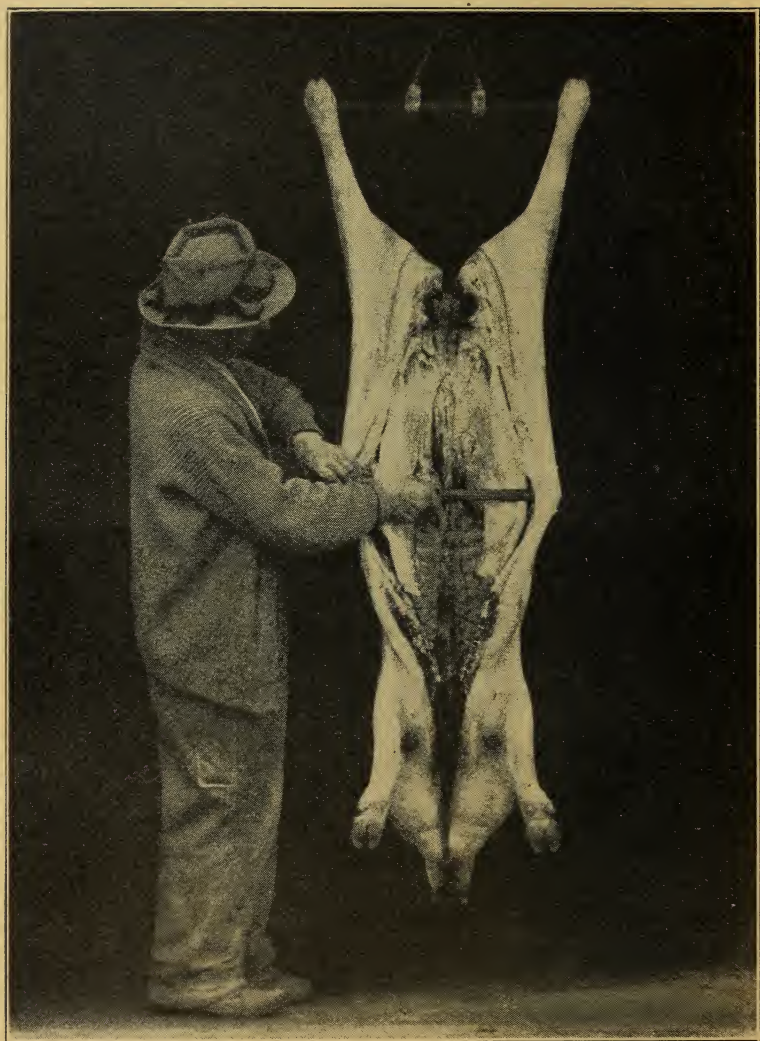


FIG. 4.—HANGING THE CARCASS UP TO COOL

Place a spread stick between the sides of the belly before the carcass is left to cool.

BRINE CURING

Cover the meat with a brine *made the day before*, using for each 100 pounds of meat the following:

8 to 10 pounds of salt.

2 to 2½ pounds sugar dissolved in 4 gallons boiling water.

2 ounces saltpeter.

The mixture should be well heated until the sugar is in solution and then cooled. The brine should cover the meat thoroughly and the meat should be weighted down with a clean stone to keep it under the brine.

Plain Salt Pork. Pork put into the brine for plain salting needs no further treatment. It should remain in the brine until used.

Sugar Cured Ham and Bacon. After the hams, shoulders and bacons have been in the brine five days, pour it off and reverse the pieces of meat, placing the top ones on the bottom and again cover with brine. If the brine is ropy, the meat and container should be thoroughly washed and a new brine poured over the meat. The bacon to be cured remains in the brine from four to six weeks. Ham may remain from six to eight weeks.

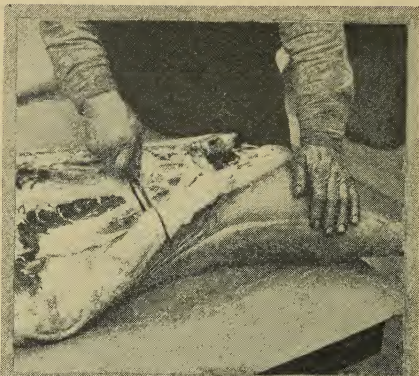
DRY CURING

More work is required for dry curing pork than for brine curing it.

Rule 1. For every 100 pounds of pork make the following mixture: 2 pounds of brown sugar (white may be used); 8 to 10 pounds of salt; 2 ounces of saltpeter; 2 ounces of black pepper, 2 ounces of red pepper (or 4 ounces of black pepper).

The thoroughly cooled hams, bacons and shoulders should be rubbed with one-half the dry mixture, left in a cool, dry place for two weeks and then rubbed with the remainder of the sugar and salt mixture. The meat should again be allowed to stay in a cool dry place for six weeks. Care must be taken to force the sugar and salt mixture into the hock ends of the bones and into the joints. At the end of the second period the smoking process should be followed.

Rule 2. For every 100 pounds of pork make the following mixture: 8 pounds of salt; 3 ounces of saltpeter; 3 pounds of sugar.



1. The ham is the first part to be removed. Make the cut just at the turn of the backbone.



2. If the ham is to be cured and smoked, it is advisable to trim it. This cut shows the section of backbone being removed.



3. The ham neatly trimmed and rounded out is now ready to cure and smoke.

1. After the ham and shoulder have been removed, the loin is separated from the side or belly by sawing through the ribs about four inches below and parallel to the backbone.



2. When the spareribs have been removed, the side can be trimmed and will be ready to cure into salt pork or bacon.



3. If the side is very large or is to be made into salt pork, it will pack and cure better when cut into smaller pieces.



Mix the ingredients thoroughly. Rub one-third of this mixture over the meat and pack it on a table or on a box leaving it in a cool dry place for three days. Do not freeze. The third day, rub on one-half the remaining mixture and again pack the meat. On the seventh day, rub in the remaining one-third of the mixture and pack meat to cure. A day and a half may be allowed for each pound of meat that is cured. At the end of the period the smoking process should be followed.

SMOKING

When the meat has remained the proper length of time in the brine, it should be removed and soaked for one-half hour in fresh water, then washed in lukewarm water. The pieces should be strung with heavy hemp twine and hung far enough apart in a smoke house, so they do not touch. Let them dry for 24 hours before starting the smoking process. Begin with a very slow fire. The temperature of the smoke house should never rise above 120° F. Two days is the shortest time required to smoke the meat. If a higher flavor is desired, a longer time may be used. (In the South the meat is sometimes smoked very slowly from 4 to 6 weeks. It is then very dry and before boiling has to be soaked 24 hours.) At the end of the smoking period open the door and ventilators and cool the meat. The kind of hard wood used affects the flavor. Green hickory or maple smothered with sawdust is good. Corncobs are an excellent substitute.

PRESERVING SMOKED MEATS

Smoked meats should be wrapped in clean heavy Manila paper and sewed into muslin sacks. The top of the sack must be tied very tightly to keep out insects. Do not use the same string that was in the bacon or ham to hang the wrapped meat, but use the string which ties the sack. Paint each sack with the following yellow wash:

Yellow wash. For 100 pounds of hams or bacons use:

3 pounds barium sulphate

0.06 pounds glue

0.08 pounds chrome yellow (POISON—be careful)

0.40 pounds flour.

Half fill a pail with water and mix in the flour, dissolving all lumps thoroughly. Dissolve the chrome yellow in a quart of water in a separate vessel and add the solution and the glue to the flour; bring the whole to a boil and add the barium sulphate slowly, stirring constantly. Make the wash the day before it is required. Stir it frequently when using, and apply with a brush.

RENDERING LARD

Leaf lard should be rendered by itself. Fat from the sides, trimmings, hams, shoulders, and neck should be rendered separately. (*The fat from the gut should be rendered alone.*) The process is the same in the three cases. First, remove all lean meat and cut the fat into $1\frac{1}{2}$ inch pieces (it may be run through a meat chopper.) Pour a quart of water into a large iron kettle and fill with the cut-up pieces of fat. Cook over a very moderate fire, never letting the temperature get to the boiling point of the water. Stir the mixture with a large wooden paddle. Continue the cooking until the fat cracklings are a light color and float on the surface. Remove the cracklings from the fire, drain them thoroughly and save them for crackling bread or chicken feed. Stir lard as it cools. When cool enough, strain through muslin cloths into jars, pails, or cans and seal for future use.

SAUSAGE MAKING

Pork Sausage. To every 3 pounds of fresh pork allow 1 pound of fat. Grind the meat and the fat through a meat chopper. Weigh the meat and spread it out in a thin layer and season with the following mixture, allowing to every 10 pounds of meat: $2\frac{1}{2}$ to 5 ounces of fine salt; $1\frac{1}{4}$ ounces of black pepper; $1\frac{1}{4}$ ounces of ground sage (or leaf sage, ground fine).

The seasoning should be sprinkled over the meat and the two mixed together and run through a meat chopper a second time. The larger amount of salt is to be used if sausage is to be dried and cold smoked as for summer sausage.

Creole Sausage. 4 pounds lean fresh pork; 2 pounds fat fresh pork; 2 large onions minced very fine; 1 clove of garlic minced very fine; 1 teaspoon of red pepper; 3 teaspoons salt; 2 teaspoons finely ground black pepper; 1 sprig thyme well minced; 2 bay leaves chopped or minced very fine; $\frac{1}{2}$ teaspoon allspice (very fine).

Grind the pork as fine as possible, fat and lean together. Then season with salt, black pepper and cayenne. This high seasoning distinguishes the Creole sausage from all others. Mince the onion and garlic as fine as possible and add; then mix the finely ground spices thoroughly with meat and grind all together. When well mixed, if desired, take the casing (the Creoles always use the entrails of the sheep for this purpose) that have been well cleaned by the butcher; scald them and wash thoroughly again. Dry them and fill with the mixture, tying them in desired lengths.

CASINGS FOR SAUSAGE

The sausage meat may be stuffed into the casings made from the small intestines of the hog. (A special stuffer attachment is required.) These may be bought quite cheaply and therefore the long process and careful washing of the intestines is not recommended.

Substitutes for these casings may be long narrow muslin bags which are from 2 to 3 inches in diameter and 18 to 20 inches long when filled. If bags are used, melted lard should be run over the outside of the bags to seal the surface.

BULK SAUSAGE

Bulk sausage may be packed in a stone or glass jar and the air kept out by a thin coating of melted lard poured over the top.

Bulk sausage may be fried, packed in a crock, covered with hot lard and stored away. It will keep fresh into summer. Salted sliced ham may be kept in the same way. It should be fried, packed in a crock and covered with melted lard.

HEAD CHEESE

Boil 25 pounds of pork taken from the head, heart, tongue, and trimmings. When the meat separates from the bones, cook the mixture and separate the bones from the meat. Cut the meat into $\frac{1}{2}$ or $\frac{1}{4}$ inch cubes (may be ground) and add the following seasonings: $\frac{1}{4}$ pound pepper; $\frac{1}{2}$ pound salt; $\frac{1}{4}$ ounce allspice; $\frac{1}{4}$ ounce cloves; $\frac{1}{2}$ ounce caraway; 2 quarts broth in which meat was boiled.

Mix together thoroughly. The cheese may be put into a clean hog paunch or into a 2-inch pan to cool.

PHILADELPHIA SCRAPPLE

Meat cooked as for head cheese is used. To 25 pounds of meat use $\frac{1}{4}$ pound of pepper and $\frac{1}{2}$ pound of salt. The bones are removed and the meat turned into the liquor in which it was cooked. It is then heated to the boiling point and cornmeal slowly added with constant stirring until the mixture is as thick as cornmeal mush. It should be stirred and boiled for 15 minutes to distribute the fibers of meat throughout the mass and then cooked very slowly (on the back of the range) for an additional hour. Pour it into shallow pans 2 inches in depth, cool and keep in a cool place. It is sliced thin and fried as needed.

SOUP MEATS FOR CANNING

Place 25 pounds of ribs, joints, and cracked marrow bones in a thin cloth sack in a large kettle holding 5 gallons of cold water. Simmer (do not boil) for at least six hours. Skim off the fat. Remove the sack of bones and add boiling water to make 5 gallons. Pack in sterile hot glass jars, partially seal and sterilize for $1\frac{1}{2}$ hours. Seal thoroughly and keep in a cool place.

CANNED FRESH PORK

Cut the pork into good sized pieces.

Brown on both sides in the frying pan and then boil slowly for about 15 minutes in liquid enough to cover.

Pack the meat into hot glass jars.

Reduce the pot liquid by boiling to one-half its amount.

Pour this over the meat in the jar.

Place rubbers and tops on jars but do not fasten tight.

Place jars on racks in wash boiler, add warm water until 2 inches above tops of jars, cover boiler and boil for 3 hours. (Or place jars in the pressure cooker, process for 1 hour at 10 to 15 pounds pressure).

Remove jars from the boiler or pressure cooker, fasten covers securely and cool rapidly.

SOAP (HARD)

7 pounds melted, but not heated fat; 1 pound soda lye dissolved in 3 quarts of water.

The lye solution should be cooled before it is added to the melted (but not heated) fat. Stir the mixture until it resembles the consistency of honey and is creamy. Pour it into granite wear pans or pasteboard boxes. When almost hard, cut it into squares. Pack it with open spaces between and allow it to dry for at least a month before using.

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Circular 140



How to Have a Successful Milk Campaign

EXTENSION SERVICE OF
THE COLLEGE OF AGRICULTURE
THE UNIVERSITY OF WISCONSIN
MADISON



WHY?

A milk campaign benefits a community because :

1. The wider use of milk means a decided improvement in the health and mentality of children.
2. Adults as well as children profit by using more milk. Doctors and nurses find better health in the entire community. Employers report fewer cases of "nerves."
3. It encourages the use of milk which is not only a "perfect food" but a most inexpensive food as well.

How to Have a Successful Milk Campaign

BY THE DEPARTMENTS OF AGRICULTURAL JOURNALISM AND
HOME ECONOMICS.



MILK CAMPAIGN increases the health and strength of a community by encouraging the use of nature's best and cheapest food.

The need for milk campaigns is urgent because of the dismaying number of children who are undernourished. Other factors than an insufficient use of milk may cause malnutrition but in most cases milk builds up most quickly the child's health and strength.

Among all the animals of the farm the dairy cow stands unequalled as a producer of human food. She converts the products of the fields, many of which are inedible for man, into human food more economically than any other class of animals.

But even more important than this economic superiority is the fact that the food she produces is of inestimable value to the human race. In fact, as a human food, milk is in a class by itself. It has been properly termed the "perfect food" and the dairy cow has well earned the title of "foster mother of the human race" bestowed upon her by the late W. D. Hoard.

MILK SUPPLIES WHAT CHILDREN NEED

Milk contains the mineral matter greatly needed in the child's growing body. Without it the teeth are not sound nor the bones strong.

Milk contains growth-promoting substances which help to make the child well and strong and give him the impulse to eat, to play and to grow.

In addition to all of its other virtues, milk is rich in protein and moreover the protein is the kind which corrects the lack of building power in cereal foods so widely used.

To complete the list of excellencies, milk also furnishes an abundance of energy-giving nutrient in the fat and milk sugar. Add to this its palatability and its wide usefulness in rendering more toothsome a host of articles in our diet and we have a wonderful food.

MILK GOOD FOR ADULTS

The increased use of milk in a community means that adults as well as children will be in better health. As a result of milk campaigns, doctors and nurses report better health in the entire community. Teachers report improved work in the classroom. Employers report fewer cases of "nerves."

Milk campaigns increase the use of nature's best and cheapest food not only among the children but among adults as well.

Milk is a most inexpensive food. A. J. Glover, president of the Wisconsin Dairy Council, explains his high regard for this product of the dairy on the basis that "pound for pound, milk has more material that the body can readily use than have most common foods. Milk makes more easily available in the body such foods as cereals, potatoes, and bread. Milk is a food for the whole family; no special dishes need be prepared for the younger members of the group if milk is used liberally in cooking, for both older and younger members will have the right food. Milk is ready to use; there is no time and expense of preparation. Last of all, milk, compared with other foods in cost of production, kind of labor required to produce, capital and investment for production, is cheap."

INSURE PURE MILK SUPPLY

Money paid for good pure milk is an investment. No other kind should be bought. If there is any reason to doubt the quality of the milk in your town, get busy and see that the supply is right. This is worth doing whether you have a milk campaign or not.

The plan of campaign given in these pages is based on the needs of city campaigns. County campaigns, school district campaigns, or state campaigns vary so widely that the local leaders must adapt the plan to suit the particular needs. Some of the committee organizations and many of the same advertising devices may be used for such campaigns.

ADOPT A BUDGET

The persons who begin a campaign for milk week should first have in mind the amount of money needed to carry it out. The amount varies according to the size of the town, the willingness of the co-operators, and the size of the campaign. A budget should include provision for these expenditures:

1. A publicity worker is highly advisable to supply good stories to the newspapers, to prepare good copy for letters, booklets, window cards and similar press or publicity matter.

If there is no daily newspaper, arrangements may be made with a local printer to print a daily milk-week bulletin.

A bulletin board in the post office or public square may also supply daily news. Sandwich boards carried through the streets or boys with megaphones may be news carriers.

2. Postage, letterheads, stationery.

3. Speakers.

4. Material for window displays, for exhibits, for demonstrations and for entertainments.

5. Films and lantern slides showing the value of milk. Many of these may be obtained at low cost from the College of Agriculture, Madison. Slides or short films may be run at the regular performances of local theaters.

6. Printed matter, including inserts in newspapers, stickers, tags for different organizations, menu cards for hotels and restaurants, window cards for shops, photographs, cuts and mats for newspapers.

Where the funds are available these additions may well be made to the budget:

- (a) Commercial posters obtained from advertising firms specializing in printed matter for such campaigns.

- (b) Paid advertising.

M I L K

A QUART A DAY

FOR EVERY CHILD

M I L K

MAKES MUSCLE

M I L K

MAKES

TEETH AND BONE

FIGURE 1.—WINDOW CARDS ADVERTISE MILK WEEK.

Striking cards in black and white or in colors should be posted in every prominent place.

- (c) Street floats, displays and decorations.
- (d) Special entertainment for children, such as "health clown" performances. (See small cut on page 3.)

PREPARATION FOR CAMPAIGN

The organization of a campaign is usually placed in the hands of a representative of the Dairy Division of the United States Department of Agriculture, or of the College of Agriculture. This saves time and labor for the local committee, because such a representative will be familiar with the details of organization and have at hand material to help in making the campaign a success. Often a stranger is better able to work harmoniously with the townspeople and to arouse greater interest in the project. Local co-operation should be sought early in preparation for the campaign.

The representative who has been selected by the people actively interested in the campaign should arrange a preliminary conference with:

(a) **The city health service** or the local health officer, first, to determine the quality of the milk sold in the town; second, to determine whether the possible supply is large enough to meet an increase in demand; third, to determine how thorough is the milk inspection of the town; fourth, to select a representative for the general campaign committee.

(b) **The milk dealers.** A leading milk dealer can help to arrange and hold a meeting of the dealers and distributors of the city. The health service could assist. The greatest use should be made of the presence of the outside representative. His experience in other campaigns should be used fully by the committee. The purpose of the conference is, first, to determine whether milk dealers are interested in increasing the use of milk; second, to determine whether they will guarantee to keep up the quality and supply of milk and not raise the price; and third, to secure financial help. It is not always necessary to get money for campaign expenses from milk dealers and distributors. Some towns contribute from the city treasury. Public subscriptions have also been used. The usual method is for the dealers to pay into a general fund an assessment made pro rata to the amount of milk sold. The dealers are interested alike in the improve-

ment of public health as well as in the stimulation of business. The real purpose of the campaign, of course, is to encourage the use of more good milk by those who need it.

(c) **School authorities.** Milk campaigns succeed best when the children are reached through the schools. It is the children who, first of all, need to use milk. The superintendent of schools should be reached first and by the outside representative. The conference may be with him alone or with members of his staff whom he may select. From him should be determined, first, the



FIGURE 2.—“IT TASTES EVEN BETTER THROUGH A STRAW.”

Teachers report improved work in schools where children are given milk every day.

degree of interest that may be expected from the schools; second, what definite promises of co-operation may be given; third, who will represent his staff on the general campaign committee. It should be agreed that school activities should be in the hands of school officials and subject matter alone be in charge of some qualified person outside.

This done, a conference of the outside organizer, the city health service representative, and the school representative should result in the selection of some local person to act as city or town chairman of the campaign. To act with this person, members of all possible organizations should be invited by telephone or letter to a general conference. The purpose of the community meeting

should be carefully explained in the invitations, possibly in a letter somewhat like the following:

Dear Mr. (Mrs. or Miss)

We are all interested in a better (name of town). For that reason you will want to co-operate in Milk Week (dates). Health experts are generally agreed that to keep a town in really good condition every person in it should be using not less than a pint of milk a day. (Name of town) people are using only a little more than (amount) a day. More milk for a better (name of town) is the idea back of Milk Week, and one that should go to every person in the city.

Mr. (name) of the College of Agriculture, Madison, Mr. (name) of the United States Department of Agriculture, Mr. (name) of the city health service, and Mr. (name) of the public schools, with Mr. (name) as city chairman constitute the general committee for (name) Milk Week. Because of its importance to the community your organization should be represented at a community meeting to plan for a campaign that will tell the story of milk to every person in (name of town). Will you come yourself or send a delegate to the meeting at (building, time, date)?

Very truly yours,

.....

This letter could be signed by the outside representative as well as by the local chairman.

Then may follow a conference with all women's clubs and organizations (president or delegate from each), all business men's organizations (delegates), minister or priest from each church, principals of schools, public nurses, representatives of local medical associations (all doctors and dentists in small towns), members of the city council, newspaper editors, officials of the chamber of commerce, leaders of the boy scouts and the campfire girls, representatives of the Y. M. C. A., Y. W. C. A., church societies, welfare associations, charitable organizations, parent-teacher associations, library boards and any other groups which may be in existence.

This conference should result in choosing some one person from each organization who will act for that group and see that co-operation is given as asked by the central committees. So far as possible, every one of these delegates should be placed in some special committee.

Now is the time for the appointment of special committees by the general campaign committee (the general chairman is ex-officio a member of each of these committees):

(a) **Finance Committee**—to plan budget and disburse money. Before making specific plans this committee should consult with the chairmen of the several committees to determine their needs.

(b) **Publicity Committee**—to collect, prepare for publication, arrange for printing or publication all printed material for the campaign; to see that this material is accurate and timely. Close co-operation with the speakers' committee, the entertainment committee, and the window display committee is especially important.

(c) **Speakers' Committee**—to plan a schedule of speeches for schools and town, to engage speakers and arrange for their coming, to plan for school of instruction for local speakers.

(d) **School Schedule Committee**—to reach all the children in the schools with talks well fitted to their understanding and to supply leaflets and tags if desired. The superintendent of schools should by all means head this committee. A schedule should be arranged which will allow the group of selected and specially trained speakers to give five to ten minute talks to each grade or group of two grades in all the schools. It may be advisable to have some one person placed on each of the school activities committees. Otherwise make the personnel of these committees as varied as possible, so that the greatest interest may be enlisted.

(e) **School Essay Committee**—to supervise the preparation of essays on the value of milk and to judge these essays, if so desired. The schools might well be represented by a supervisor of English. A list of suggested subjects is found on page 23.

(f) **School Poster Committee**—to supervise subject matter and preparation of posters showing the value of milk. An art teacher should be on this committee. A list of subjects is found on page 23.

(g) **School Entertainment Committee**—to arrange for special plays, dances and drills to celebrate Milk Week. "The Milk Fairies," a play published by the National Dairy Council, Chicago, may be given by each school. It is typical of the work this committee may encourage and supervise. Its members should arrange for plays, books or plays, costume materials, etc.

(h) **Films and Slides Committee**—to obtain and arrange for the presentation of slides and films on the value of milk.

(i) **Transportation Committee**—to arrange transportation for speakers and to provide materials.

(j) **Window Display Committee**—to solicit materials, and plan for window exhibits in stores. A list of suggested windows is given on page 25. The members may expand their work to include other exhibits, if desired.

(k) **Street Advertising Committee**—to arrange for street parade or for exhibits on the streets.

(l) **Poster and Window Card Committee**—to select, purchase and place commercial posters and to place window cards supplied by the publicity committee. They should co-operate with the publicity committee in the selection.

(m) **Prizes and Awards Committee**—may give all prizes awarded for different school activities, window displays, and parade stunts. This committee should determine the prizes by consulting with the financial committee. Many prizes may be contributed.

(n) **School Survey Committee**—is both pre-campaign and follow-up. The purpose is to discover the under-nourished children in the schools, to determine the percentage of undernourishment, to find out how many children drink milk and how much, as well as what their other health habits are. After the campaign the same facts are checked over to determine the value of the campaign to the children. At least a month should be allowed before the second survey is made.

On this committee should be such persons as a doctor, nurse, progressive teacher, mother, dietitian. The committee's work should be accurate and should interpret the facts; this requires persons of training, sympathy and interest.

(o) **Records Committee**—to keep clippings, pictures, and comments on the milk campaign for future reference and inquiry.

Even before the campaign begins the publicity committee should have newspaper stories prepared giving the reason for having a Milk Week showing why milk should be used more; listing organizations and committees for the campaign; and enumerating coming events of general importance.

THE CAMPAIGN UNDER WAY

Publicity for the day's events is important; publicity for the events to come is equally important. Some one person on each committee should be responsible each day for communicating directly to the publicity worker the events known to that committee, both those of the day and those to come.

It may even be advisable to have a general conference of committees preceding the week of the campaign to acquaint all the workers with the importance of getting interesting information into the newspapers and getting it there on time. There should be emphasized the importance of getting names, names of everybody in town who is interested—not just the last name, but how to spell it, what the first name is, to what organization the person belongs, and what his work is.



FIGURE 3.—WHEN MILK FAIRIES FROLIC.

Scene from "The Milk Fairies," a play which may easily be given by school children. Copies of the play may be secured from the National Dairy Council, Chicago.

A daily conference of the leaders to discuss the affairs of each day may be planned; remembering that having too many people in a conference usually ends in nothing accomplished.

Events of the week should be planned so that there is always something especially interesting to which to look forward; not all the cream of entertainment should be put either at the first or last of the week.

Window displays should be in place the opening day of the campaign. Window exhibits wherein girls cook, eat, or otherwise demonstrate, gain in value if there is a change of personnel every day. For instance, in a double window exhibit where two girls cook each day and four children eat the meal provided, all six persons should be replaced the next day.

The opening of the campaign should see the work of each committee completely outlined and scheduled. It should be known when and where meetings of these committees will be held and just who will take part in them. For example, the speaker's committee should have a list of all meetings at which a Milk Week representative may talk; Ladies' Aids, business men's clubs, welfare centers, down-town booths, the courthouse square, and any



FIGURE 4.—NEW WAYS OF SERVING MILK.

At the state fair, "Milk Drinks for Everybody" were very popular. How to make them is explained in Wisconsin Circular 138.

other public places. If a chalk talk, for instance, is to be given daily at a certain hour in a down-town window, this information should be given to the publicity worker in advance of the first day.

The publicity worker should have an outline of possible stories, necessary stories, advertising (paid and otherwise) and posters, cards, tags, and such other matter in the hands of special committees. Editorials prepared in advance of Milk Week and presented to the editors with the recommendations that they adapt the editorials to suit themselves may also be on the outline of publicity material.

Acrostic contests, puzzles, and similar devices in newspapers may sometimes attract attention. A calendar of the day's events may appear in a bold face box on the front page of each newspaper if such an arrangement can be made with the editor.

MILK WEEK

**CITY OF MADISON
COLLEGE OF AGRICULTURE
U. S. DEPARTMENT OF AGRICULTURE
DAIRY DIVISION
CO-OPERATING**

FIGURE 5.—AN EFFECTIVE WINDOW CARD.

This card should be used in all window displays and should also be posted conspicuously in other public places.

Photographs of local events may be used in the newspapers if there is money to pay for cuts and facilities for making them on short notice.

Any device which will make news out of material that must be frequently repeated or that will make a purely informative article on milk generally interesting, should be used. If there is a publicity worker, the general committee or publicity committee may not need to assist, but otherwise the efforts of both committees should be to get publicity during the campaign.

Suggestions for stories: each day's events and announcements of the next day's plans; human interest stories about persons taking part in Milk Week, children's reactions to Milk Week; the milk film; the talks in the schools; the school survey; what

mothers in the parent-teachers' association think about Milk Week; what ministers think about Milk Week; window displays; special demonstrations (a story on each); stories of gaining weight from the use of milk; what milk does for the teeth (quote local dentist, if possible); milk to keep well and make well (quote doctors and nurses); school entertainments ("The Milk Fairies" play—National Dairy Council, Chicago); what-where-who digest talks given in public meetings; the poster contest; the essay contest; dairy dishes contest; how to have clean milk; milk campaigns in other cities.

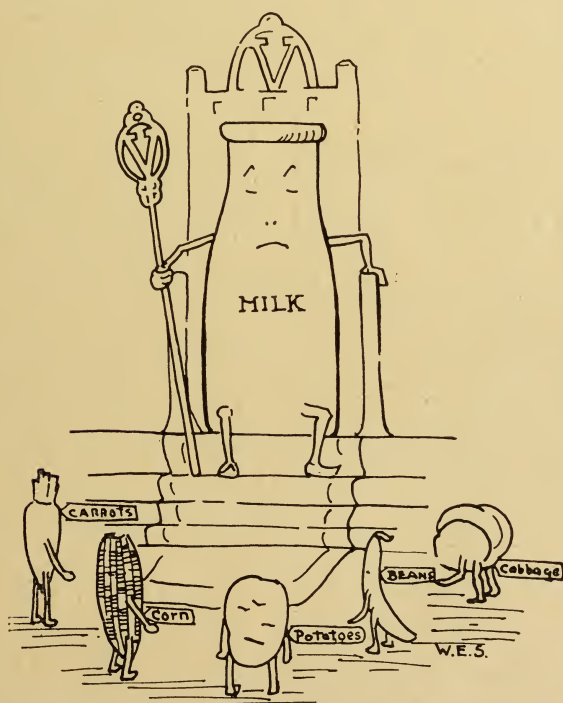


FIGURE 6.—HIS MAJESTY, KING MILK.

He rules supreme in the court of foods, and brings health and happiness to his faithful subjects.

COOK WITH MILK TO IMPROVE FOODS, ADVICE OF EXPERT HERE

Mrs. Nellie Kedzie Jones Sketches Simple Recipes to Popularize Milk in Family Kitchen

BY NELLIE KEDZIE JONES.

The story of milk is only half told when the household learns to drink milk. The rest of the story is one that only good cooks know. How to get both flavor and food value into simple food is the secret of cooks who use milk. Meat gravies, all kinds of doughs and batters, cereals, puddings and pudding sauces, soups, vegetables, are all made delicious by the addition of milk.

Meat drippings browned and thickened with flour rubbed up with milk instead of water, make an extraordinarily good gravy. If the amount of gravy is a little scanty, add milk instead of water to increase it.

Muffins, pancakes, biscuits of all sorts, are the better if milk is used for wetting. Popovers, waffles, are foods that should be better known to American tables, both for the deliciousness and their food value. A muffin recipe I like, and one that can be made to fit several flours is a mixture of half cornmeal and half wheat flour, or two-thirds graham and one-third wheat flour, or any other combination preferred. Use 1 egg beaten, 1 cup milk, 2 even tablespoons sugar, 3 tablespoons melted fat, 2 cups flour, 2 teaspoons baking powder, $\frac{1}{2}$ teaspoon salt. This may be varied by using sour milk to which has been added soda in the proportion of an even teaspoon to a cup of milk, but the same amount of baking powder should be used. Sour milk is especially delicious when sorghum or molasses is used for sweetening.

Cook Cereals in Milk.

Rice cooked in milk is a real delicacy. Milk and water, or all milk, may be used in the proportion of

four cups of wetting to one cup of washed rice. If there is milk enough pour the whole amount over the washed rice and set it in the oven or in the double boiler and allow it to cook until the rice has absorbed all the milk. If some water is to be used, add to two cups of boiling water a teaspoon of salt and one cup of washed rice. Let this simmer until the rice has absorbed the water and then add two cups of milk. Cook slowly in the oven until the rice has absorbed the milk.

A rice pudding that simply melts in your mouth is made from one-half cup of rice, a quart of milk, a teaspoon of vanilla, and a half cup of sugar. Bake very slowly for three hours and eaten either hot or cold, this dish is so good to look at and so much better to eat that it will be one of the family favorites.

Even when the gas range is used these dishes need not be expensive as to fuel. In the first place, the heat is low, and the time used in preparation is not usually very much. Many of them are best made, however, when the oven can be filled with other food, so that a long-time fire is justified. Where there is a laundry stove, rice or rice pudding may be baked on wash day.

Use Bread and Milk.

Milk in cooking is not, as some would have us believe, entirely a substitute for meat. While it will prevent the necessity for so much meat, it will not take the place of meat entirely.

Bread and milk, for example, make a most satisfactory supper with, perhaps, the addition of baked apples. Cornmeal mush and milk is an old standby that makes the use of meat unnecessary.

MILK EXPENDITURES 44 PER CENT OF WHOLE

Dairy Products Should Hold Large Place in Food List, Declares Expert at University

BY ABBY L. MARLATT

Department of Home Economics,
University of Wisconsin

Two skeptical Madison housewives have asked me how the expenditures for milk and milk products can possibly be 44 per cent of the total amount paid for food and yet leave anything else to eat. That the amount paid for milk products should be 44 per cent of the entire food expenditures is the estimate of Professor Sherman of Columbia university, and one that has been generally accepted by advocates of milk. The advantage to which this amount of milk may be used is evident in the menus given.

The children should have milk to drink at every meal. Cocoa is allowed instead of milk at breakfast. The grown-ups too may substitute for coffee. Egg appears in each dinner menu along with meat, the egg being for children. A milk soup is planned for each luncheon or supper.

The following menu is suggested for a two week's rotation:

BREAKFAST—Oat meal, cream, sugar, toast, butter, stewed prunes, cocoa or coffee.

LUNCH OR SUPPER—Cream of lima bean soup, baked potatoes stuffed, bread, butter, milk, cocoa, apricots, cookies.

DINNER—Tomato bouillon, crackers, poached eggs, roast beef, spinach, mashed potatoes, bread, butter, gravy, junket, milk, coffee.

THURSDAY

BREAKFAST—Bananas, wheat-germ meal, top milk, sugar, entire wheat bread, butter, milk, cocoa, coffee.

LUNCH OR SUPPER—Potato soup, baked squash, macaroni and cheese, nut bread, butter, milk, cocoa, prune whip.

DINNER—Brown broth, crackers, coddled egg, creamed beef, buttered carrots, baked potato, graham bread, chocolate blancmange, milk, coffee.

FRIDAY

BREAKFAST—Oranges, cracked wheat, cream, sugar, rye bread, butter, milk, cocoa, coffee.

LUNCH OR SUPPER—Oyster soup, creamed peas, cheese souffle, toast, milk, tea, baked apple.

DINNER—Veal and sage broth, crackers, scrambled egg, salmon loaf, rutabagas, string beans, Boston brown bread, butter, rice pudding, milk, coffee.

SATURDAY

BREAKFAST—Apple, puffed rice, top milk, sugar, oatmeal, bread, butter, milk, cocoa, coffee.

LUNCH OR SUPPER—Celery soup, kidney beans, fruit salad, sandwiches, stewed peaches, cookies, milk, tea.

DINNER—Chicken broth, crackers, baked egg, veal loaf, peas, riced potatoes, entire wheat bread, butter, Indian pudding, milk, coffee.

SUNDAY

BREAKFAST—Stewed apricots, rolled oats, cream, sugar, nut bread, butter, milk, cocoa, coffee.

LUNCH OR SUPPER—Spinach soup, sweet potato, vegetable salad, graham bread, butter, gingerbread, milk, cocoa.

DINNER—Beef broth, crackers, shirred eggs, chicken pie, lima beans, brussels sprouts, rye bread, dinner rolls, tapioca cream, milk, coffee.

MONDAY

BREAKFAST—Baked apple, malt breakfast food, top milk, sugar, raisin bread, butter, milk, cocoa, coffee.

LUNCH OR SUPPER—Tomato soup, rice and raisins, cheese salad, rolls, butter, tarts, milk, cocoa.

DINNER—Macaroni soup, crackers, egg on toast, leg of lamb, creamed corn, cauliflower, Swedish rolls, butter, queen of puddings, milk, coffee.

TUESDAY

BREAKFAST—Grapefruit, barley grits, cream, sugar, toasted muffins, butter, milk, cocoa, coffee.

LUNCH OR SUPPER—Black bean soup, scalloped tomato, nut and celery salad, raisin bread, butter, sweet wafers, milk, cocoa.

DINNER—Julienne soup, crackers, omelet, baked ham, sweet potatoes, pickled beets, cinnamon rolls, butter, chocolate cream, milk, coffee.

MADISON SCHOOL CHILDREN HEAR TALK ON VALUE OF MILK TODAY

Squad of Speakers Appear Before Classes Today and Tomorrow; Jolly Jester Coming to Tell His Story to Tots

Children in 10 Madison schools heard the story of milk today from the squad of milk specialists headed by Miss Gladys Stillman and organized for appearance before the schools by R. S. Dudgeon, assistant superintendent. The schedule allows 10 minutes at each school for the talk and the distribution of leaflets. Miss Gladys Stillman addressed first and second grades, Miss Betty Miller third and fourth grades, Miss Vera Dixon fifth and sixth grades, Miss Gladys Meloche seventh and eighth grades.

This morning the squad talked at the following schools: Brayton, St. Patrick's, Harvey, Marquette, Lap-ham, Lincoln. This afternoon schedule was, Lowell, St. Bernards, Hawthorne, Emerson.

Wednesday's program is: 9:00 Holy Redeemer, 9:30 St. Raphael's, 10:00 Doty, 10:30 Washington, 11:00 Draper, 1:30 Randall, 2:00 Edgewood, 2:30 St. James, 3:00 Longfellow.

Healthland is a great and wonderful country with which all children should become acquainted. The animals, trees, and plants talk to each other. Everybody is happy because everybody helps everybody else. It is from this wonderful country that the Jolly Jester comes to the boys and girls of Madison. With him he brings his horse, Dobbin, who thrives on oatmeal, Charley Carrot and his many cousins, Friend Water, the Milk Bottle, the Health Monkey and the Elephant. Last of all is Harry Jester, the little boy from Healthland, who has been taught many things about milk, vegetables, and fruit by the kind people of that country.

The Jolly Jester and his people from Healthland will appear at the Strand at 10:30 tomorrow morning and at the University Gymnasium

at 1:30 tomorrow afternoon. The doors will be open 15 minutes before each performance. The performance is free. Older people may come to hear the Jolly Jester, especially if they bring children with them, but the front seats belong to children. The grown-ups may like to know that he is J. Wallace Mackay, once of Edinburgh but now an American citizen. He comes from a Scotch family of note, including in his ancestry such names as Haig, Wallace, and Mackay. He has had a long career as society entertainer and actor. The war broke in upon his work and for a year he was an entertainer on the Belgian and French battle fronts. Returning to this country he was engaged by the Child Health Organization of New York to present health work to children.

MEN URGED TO USE MILK IN LUNCHESES

**"TRY BOWL OF HALF-AND-HALF
EACH DAY FOR MONTH," EX-
PERT ADVISES ROTARIANS
IN TALK**

"Try a bowl of half-and-half with crackers for lunch each day for a month," said Miss Jessie Hoover of Washington, D. C., to members of the Rotary club at their noon meeting today, "and see how you feel after a month of that treatment. The busy business man usually takes a luncheon that would do credit to a manual laborer, and the result is that, in the effort to digest the meal, as he sits in the office or

(Continued on page 19.)

MEN URGED TO USE MILK IN LUNCHES

business house, the blood is around the stomach most of the afternoon, whereas it ought to be around the brain, keeping him fit to meet his competitors."

TELLS OF CAMPAIGNS

Miss Hoover, representing the United States department of agriculture in Madison Milk Week, told the Rotary club how milk campaigns are begun. Madison figures now being compiled by Miss Gladys Stillman show the need for education on milk. In one school where 238 children in the four upper grades reported, only 167 used milk daily, and 110 used coffee daily. E. A. Babcock of the city health department, reports that the average per capita consumption of Madison for ice cream, cheese, butter, cream and milk is just a shade more than a third of a quart a day. Miss Emily Elliott, director of health in the public schools, was consulted before the campaign was begun. Miss Elliott says that a milk campaign is certainly needed, and, says Miss Hoover, "no one is better qualified to judge."

MAYOR DESIGNATES MADISON MILK WEEK

BY MAYOR KITTLESON

Food is one of the great allies of well-being, and of all foods milk is the most necessary to the health and happiness of the young and the weak.

The American child must have milk if he is to grow into a healthy, normal, worth-while citizen. The time to see that he has this chance is while he is still growing. Madison schools are doing much to insure this, and Madison mothers and nurses are helping to promote an understanding of the value of milk and an increasing consumption.

That the whole city may appreciate the importance of milk, in the growth and well-being of the children, the college of agriculture, the dairy division of the United States department of agriculture and the city of Madison are uniting in a campaign of education, and I hereby proclaim the week of February 21-26 Madison milk week.

The co-operation of all our people in this campaign is earnestly solicited.

MADISON IN FIGHT TO BRING HEALTH TO CHILDREN THROUGH USE OF MILK

Malnutrition of American Kiddies Revealed in Scrapbook of Expert Now Here to Aid Campaign

The story of a nation-wide effort to fight undernourishment in growing children is told in the scrapbook of Miss Jessie Hoover, milk specialist from the United States department of agriculture, who is in Madison this week to assist in putting on Madison Milk Week.

Miss Hoover has, in the last two years, conducted over 40 educational campaigns in the United

States, all in the interest of better health for children. In every case where the milk campaign has been staged there has been an increase in the consumption of milk, going as high as 30 per cent in some cities. What this means for the health of the country is difficult to measure, Miss Hoover is proud to say, for milk campaigns put on in

(Continued on page 20.)

MADISON IN FIGHT TO BRING HEALTH TO CHILDREN THROUGH USE OF MILK

one city have resulted in more campaigns in neighboring cities, and Milk Week has even grown into a year or two years of education on the value of milk.

CONDITIONS BARED

Miss Hoover's story is a revelation of conditions of under-nutrition among American children. She began her work in Connecticut, where she organized six cities, the first of them Hartford and New Haven. Next she went to Newport, Rhode Island, where Miss Gladys Meloche, now Home Economics Extension worker in the University of Wisconsin, had charge. In New Jersey she conducted campaigns in four cities, in Massachusetts she assisted in a 12-months campaign put on by the city of Boston. Other cities that have had milk campaigns include Pittsburgh, Topeka, Kansas City, Detroit, Davenport, Iowa City, Akron, Spokane, Seattle, Tacoma, Baltimore wants a year's campaign, Iowa put on a statewide campaign for two years and the whole state took part. Norfolk, Virginia, wants to have a campaign, but they find that there is in the country only two-thirds of a cow to each hundred persons, so the milk supply is not adequate. Unless there is enough milk, the department of agriculture does not co-operate in a milk campaign.

40 PER CENT UNDERWEIGHT

What is the secret back of the very general interest in milk? Miss Hoover is not prepared to support the often repeated statement that under-nutrition is growing since the war. However, she quotes New York City records to show an increase from 5 per cent under-nutrition in 1914 to 21 per cent in 1917, and this increase was accompanied by a 25 per cent decrease in milk consumption. Figures for the rest of the country are not generally available.

A survey of 10,000 Chicago school children found that 40 per cent of the children were 7 per cent under weight. Unexpectedly, it also developed that of the number who

were below weight 57.7 per cent were from the comfortable homes in the residential section and only 16.2 per cent from the Union Stock Yards district. This fact, Miss Hoover says, demonstrates the necessity for teaching more about the value of foods, for the fault here was not poverty, but ignorance of the necessity of certain foods for growing children.

In Kansas City, children in 55 schools were weighed and measured. In the colored districts 12 per cent of the children were 10 per cent or more below weight. In the rich white residential sections 52.9 per cent of the children were under-nourished.

SHOWS NECESSITY

"From figures like these a city can gauge the necessity of the milk campaign," says Miss Hoover. "A milk campaign is never conducted by the Dairy Division of the United States Department of Agriculture unless there is local feeling that it is needed. It is then made certain that the milk is pure and wholesome, that the supply of milk is adequate, and the price reasonable to the producer, the distributor, and the consumer. In the campaigns the Dairy Division co-operates always with the state agricultural college, and the college gets the co-operation of the local agencies. Madison has been very fortunate in getting the very active co-operation of the city board of health, the parent-teacher association, and the public schools.

"The milk campaign is put on in the interests of the children. Two important reasons for under-nourishment in children are poverty and lack of understanding of the nourishing properties of certain foods. What milk campaigns can do to teach the value of milk for the growing child is so much added to the general question of child welfare.

MANY HAVE NO MILK

"Some interesting surveys have been made in connection with these

(Continued on page 21.)

MADISON IN FIGHT TO BRING HEALTH TO CHILDREN THROUGH USE OF MILK

campaigns. In Springfield, Mass., half the schools showed 20 per cent of the children drinking no milk, and in some of the schools as many as 50 per cent of the children were using no milk. In a certain county in Kansas, in the richest agricultural district in the state, a survey of 639 children in 30 school districts showed that 140 were at least 10 per cent below weight and only 42 per cent of them used milk every day.

"In three townships of a certain county in Iowa 51 per cent of the children were under weight. At least 10 per cent of them were using no milk. In another Iowa county conditions of under-nourishment were from 15 to 41 per cent, and about 30 per cent of the children under weight were using no milk. The Children's Bureau, in a survey made in Washington, D. C., 482 children from two to seven years, found more than half of them were getting no fresh milk.

VITALLY NECESSARY

"That milk is actually necessary to the under-nourished child is being proved many times over in every home where there is interest in milk. In Greenville, South Carolina, where there is soon to be a milk campaign, Dr. Ramsay, president of the local women's college, paid this tribute to milk: 'For 67 years we have never had a death of a boarding school student. We have our own herd of dairy cows. What milk we cannot use we sell. We went through the flu epidemic safely, by keeping the dormitories heated evenly and then feeding milk.'

The value of milk again is proved in the case of certain colored districts in Kansas City, where a survey made in May, 1919, showed 37 per cent of the children to be under nourished. They were given a school lunch of milk and graham crackers, and by September, 1919, the percentage of under-nutrition had fallen to 25 per cent. The next March only 3.7 per cent of the children were below weight, and the teachers expected to have them all

up to standard at the end of the year. The only change made, so far as could be determined, was in the addition of the lunch at school.

CURED BY MILK

"Repeated experiments with milk in feeding growing children have resulted in their being brought up to standard weight. For instance, in Springfield, Massachusetts, 48 children were put on test for six weeks. - The total gain of the whole group was 1,426 ounces, an average of nearly 1.9 pounds for each child. They would normally have been expected to gain only 531 ounces, or a pound and a quarter each. Milk was given at school as an addition to the regular diet.

"These same results are repeated everywhere. Nurses, home demonstration agents, teachers, and mothers all know the result of giving the child the milk he needs. In Madison the schools, the parent-teacher associations, and the city nurses have demonstrated over and over these same results, I am told. What we want to do in milk week is to make the task of these helpers of children easier to accomplish."

MILK WEEK FILM ON SCREEN TONIGHT

SCENES IN MADISON WILL BE
DEPICTED; ACTORS ALL MAD-
ISON CHILDREN; JESTER
MAKES HIT

Holiday visitors to downtown motion picture houses tonight will see the film especially prepared for Madison Milk Week. The Four Ms, Milk, Muscle, Mind and Men, is a made-in-Madison film. M. E. Diemer is the photographer, Miss Gladys Stillman scenario writer, and Miss Emilie Elliott, stage manager. The scenes are taken at the Longfellow and Lowell schools,

(Continued on page 22.)

MILK WEEK FILM ON SCREEN TONIGHT

under the supervision of Miss Lorena Reichert and Miss Liona Hopkins, principals. Miss Elliott vouches for the fact that all the actors are honest-to-goodness Madison children, just as they look in any other Madison school when they form the morning milk line.

Arrangements are being made by F. J. McWilliams, manager of the Grand theater, to have the film run at the regular performances in each of the Madison movie houses. The films will be relayed to three other theaters for the latter part of the week. Tonight the Strand, Grand and Fuller show the picture.

Today was children's day in the Milk Week program as 3,000 Madison youngsters are ready to testify tonight. The Jolly Jester made a real hit in both his performances, the first for east side schools at the Strand this morning, the second for

west side children at the University gymnasium this afternoon. The children filled both houses to the doors. The Jester used his skill as a ventriloquist, not only to get his health message across, but to bring in amusing interludes so that his young audience might not tire of the performance.

The regular schedule of talks at the schools will begin at 9 a. m. tomorrow, with the same group of speakers, Miss Stillman, Miss Miller, Mrs. Dixon, and Miss Meloche. They will talk at these schools: Holy Redeemer, 9:00; St. Raphael's, 9:30; Doty, 10:00; Washington, 10:30; Draper, 11:00; Randall, 1:30; Edgewood, 2:00; St. James, 2:30; Longfellow, 3:00. Miss Jessie Hoover, representative of the United States department of agriculture, and Mrs. Nellie Kedzie Jones, home economics department, will talk at Madison high school, Wisconsin high school and the continuation school.

Subject Matter—

1. Sources of material for general use:
 - Wisconsin Dairy Council, Ft. Atkinson.
 - Wisconsin College of Agriculture, Madison.
 - Dairy Division, U. S. Department of Agriculture, Washington, D. C.
 - Children's Bureau, Department of Labor, Washington, D. C.
 - National Dairy Council, Chicago.
2. Suggested leaflets for distribution from:
 - Wisconsin Dairy Council.
 - National Dairy Council.
 - U. S. Department of Agriculture.
 - College of Agriculture, University of Wisconsin.
3. Suggested posters from:
 - National Dairy Council.
 - College of Agriculture.
 - Commercial Advertising Concerns.



Liberal Use of Milk The Children's Need

Growing children must have bone-making, muscle-building, mind-developing food. Milk—in a manner unlike any other food—builds up your children and preserves their health. That is why milk is the economy food. One quart of milk contains food strength that cannot be equaled in any other food at far greater cost.

The Milk Way is the Health Way

Read what the U. S. Food Administration says: "Every household in which there are children should be a household in which there is milk in abundance."

Milk is the perfect food. The reason is milk contains all the elements necessary to the sustaining of life, body-building, muscle-making and mind developing.

Milk should be used in every edible way in the

household. Mothers will find milk has more strength for its cost than other foods. Milk is just what children need and nothing can take its place.

Milk—and the products of milk—butter, cheese and ice cream—have in them the energy elements that will keep this nation big and strong.

As you want your country big and powerful, make your children healthy and strong.

AT LEAST A QUART OF MILK PER DAY MAKES CHILDREN HEALTHY, ROMP AND PLAY

Begin today—a quart of milk per child per day. The health way is the milk way. Use milk liberally. Cook with milk.

**Eat More Butter — Eat More Cheese
Eat More Ice Cream**



No. 1 of
National Dairy
Council
Press Publicity
Series

(This Space for Dealer's Name)

FIGURE 7.—LOCAL MILK DEALER'S ADVERTISEMENT

Both type and illustrations for attractive advertising are supplied by the National Dairy Council.

SUGGESTED SPEAKERS.

Local speakers should be trained in a school of instruction taught by some one who is familiar with the work in a milk campaign and who also knows the subject of milk as a food. Such a person may be found locally in some communities. Trained workers from the agricultural extension service of the University of Wisconsin can be obtained if applications are placed sufficiently in advance.

SCHOOL ESSAYS

The essays should be written only in the upper grades, or in some cases, in high school classes. Such subjects as "Why I Drink Milk," "What I've Found Out About Milk," "What Milk Did For Me," "My Experience With Milk," "What the Lady Said" (special talk given in the school), and "Why Our Town Needs a Milk Campaign," are suggested.

The teachers in the respective grades have charge of the contests and manage the selection of the best essays from that grade, or the principal of the school may be the judge. Where there are only a few schools in the town, five or six from each grade may be selected as best and go to the essay committee or to the committee on prizes and awards for judging.

SOME POSTER LEGENDS BY SCHOOL CHILDREN

Drink lots of milk and preserve your health.

With health comes power to gain more wealth.

He says "Drink more milk, it makes better citizens."—Uncle Sam.

Get a sure grip on health. Drink more milk. (fist.)

A quart a day keeps the children at play.

Flowers need water. Children need milk.

When Fred arises in the morn and finds no milk he's quite forlorn

BUT

Look at him when milk he sees—nothing else as much can please.

Try it! (Two faces compared).

The milk alarm (Baby crying).

Oh! Milk don't run away—I will need you today (Bottle with arms and legs).



FIGURE 8.—POSTERS MADE BY SCHOOL CHILDREN.

Making posters about milk is fun for the children and also emphasizes in their minds the value of milk.

Milk for me. Them's my sentiments.

Milk makes kids husky.

I gained — pounds in one month. I drink milk (Girl on scales).

Milk is as good now as it was then (Girl in hoop skirts).

We all like milk, it makes us husky (Toboggan).

Two sides of a question—take your choice:

(Milk bottle—face, corners mouth turned up;

Coffee pot—face, corners mouth turned down.)

The army of health. Join now by drinking milk.

Success and health—milk makes brawn and brain.

SUGGESTIONS FOR WINDOW DISPLAYS

The committee on window displays should first plan a series of exhibits and then visit the managers of various stores to see if they will co-operate. It is advisable for the committee to ask for a conference with the window trimmer, and explain the proposed exhibits carefully.

These displays have proved effective:

1. How animal feeding illustrates the food value of milk.

Rats or puppies that have been fed diets containing milk and diets without any milk may be used to show the contrast in weight and strength between properly fed and and improperly fed animals.* A card may be used to tell the age of the animals and what their diet has been.

2. "The Fountain of Health." A florist's fountain may be effectively used for this display. Use lime water to represent milk flowing from the fountain and if possible arrange to have colored lights flashed on the flowing milk. Wax figures of women and children may be used in the window. Have the motto, "Drink Milk for Your Health," on a large card in a prominent place.

3. "How Tom Made the Team." A wax figure, dressed in ordinary boy's clothes, standing on scales is used to represent Tom before he drank milk. A card explains that he is seven pounds underweight. Beside him is a robust boy dressed in football uniform holding a bottle of milk in his hand. A card explains that the change in Tom is due to the fact that for two months he drank one pint of milk daily and gained two and

*Write to the Home Economics Extension Department of the University of Wisconsin.

one-half pounds and then took one quart of milk daily for two weeks and gained two and one-half pounds more.

4. Foods Prepared With Milk. The dishes prepared in the cooking contests in the high school or vocational school may be used in a very effective display. Cream soups, creamed vegetables, desserts, and invalid trays may be exhibited but the dishes should be varied daily.

5. A Dairy Products Meal. Two or three girls prepare and cook dairy products dishes in the window on one side of the



FIGURE 9.—“THE FOSTER MOTHER OF THE HUMAN RACE.”

A docile paper cow, in a setting of posters extolling the merits of milk, makes an interesting window display.

store. A small gas or oil stove may be used. The recipes are printed on cards. The food prepared is served in the opposite window to four children sitting around a dining table. A dining room set may be borrowed from a furniture store for this exhibit. A menu card in the window tells of what the meal consists. Breakfast may be served one day, dinner the next, and supper the last. About two and a half hours should be allowed for this demonstration, the last half hour for serving the meal.

6. The Materials That Make Up Milk. In this exhibit, test tubes containing the relative amounts of the various sub-

stances that make up a gallon of milk are shown beside a gallon can containing milk. A large photograph showing the test tubes may be used.*

7. Special Exhibits Planned by Public Health Nurses and City Board of Health.

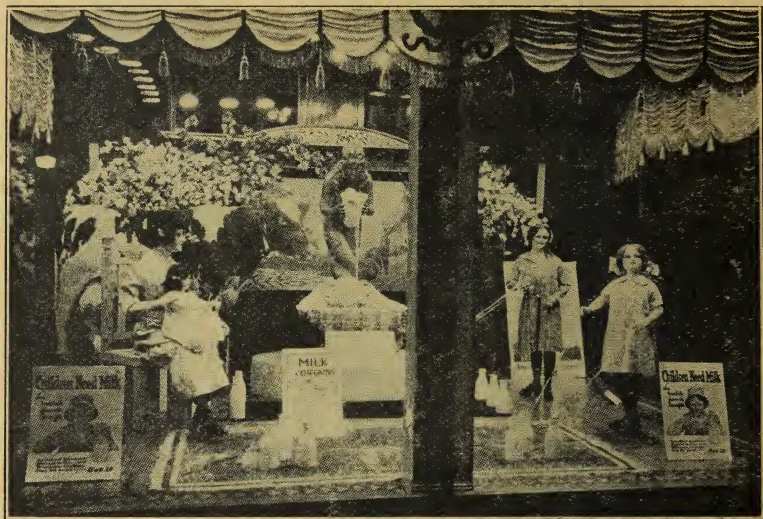


FIGURE 10.—“THE FOUNTAIN OF HEALTH.”

Greater effectiveness may be given this window display by flashing colored lights on the flowing milk.

SCHOOL TALKS

Since it is Children First in Milk Week, special plans are always laid to reach the schools first of all. A plan which works well is to have the superintendent send out a letter which contains, as a result of conference with the speakers' committee, the schedule for visiting schools.

Four speakers will be needed for each school; one to first and second grades; one to third and fourth grades; one to fifth and sixth grades; one to seventh and eighth grades. The substance of what is to be said has been taught in the school of instruction, perhaps, or special speakers may have been

*For aid in planning this exhibit and in securing the necessary equipment write to the Home Economics Extension Department of the University of Wisconsin, Madison.

engaged. Chalk talks, photographs, and experimental animals may be used to give variety. The talks should not be more than 10 minutes long. At the end of the period, leaflets are distributed for the children to read and to take home to their



FIGURE 11.—WHAT MAKES UP A GALLON OF MILK?

Here are actual test tubes containing the relative amounts of all the substances that compose milk.

parents. The leaflets should, as far as possible, be suited to the age of the children.

FILMS AND SLIDES

"The Story of Milk" from the College of Agriculture, should be spoken for long in advance. The copies are in great demand. The film is about twenty minutes long and the scenes are all taken in Wisconsin. Use in connection with it the story on the film given under publicity exhibit.

"The Four M's" is a four-minute film taken in Madison as a part of Madison Milk Week. It shows school children and milk distribution in the schools.

Lantern slides may be made locally by a good photographer from pictures which illustrate the value of milk. Some slides

may be obtained from the College of Agriculture, Madison. Slides are useful to slip in with the regular program at local theaters.

ADVERTISEMENTS

Newspaper advertising for Milk Week is of three kinds: ads paid for from Milk Week campaign funds, ads supplied



FIGURE 12.—FAIRIES THAT LIVE IN MILK.

Milk talks in the lower grades arouse a keen interest when the fascinating "Fanny Fat" and her four friends are introduced.

by local merchants in which their names appear, brief lines of advertising or the day's program printed as a box in the regular advertising.

Copies of advertising of milk as a food are supplied, both type and illustration, by the National Dairy Council.

Tags, menu cards, newspaper inserts, milk bottle cards, and other advertising devices. These may be supplied by dairy advertising firms.

Milk dealers may often wish to advertise business by milk bottle cards delivered with the bottles or attached to them.

School children wearing tags are walking advertisements of the milk campaign. They should be given the tags at the very beginning of the campaign and sentiment for wearing the tags that week should be encouraged. Older persons wearing them offer encouragement to the children. The campaign committees may well begin the practice.

Menu cards in all the restaurants and hotels are very effective. They may be varied every day if the houses co-operate willingly. All dishes containing milk should be red-lettered, underlined, italicized, or bold-faced to show the fact. Some member of the general committee should be charged with the job of interesting proprietors of eating places with the value of milk both for food and flavor.

Newspaper inserts may be put in the folds of papers delivered at residences, business places, and news stands. This requires the co-operation of the newspaper business force and the newsboys.

RECIPE BOOKS AND LEAFLETS

A general leaflet may be distributed at meetings, in window exhibits, or in schools. A special leaflet containing favorite recipes of famous cooks in the town—the recipes emphasizing milk, of course—may be printed as a souvenir of the campaign. This might be distributed at an evening meeting.

MILK IS NECESSARY

Milk is the indispensable food for children, and whole milk in some form must be furnished them, if the nutrition of the average child is to be maintained and if normal growth in height and weight is to be assured.

Clean, fresh cows' milk is the best available form of milk for children after they are weaned. Pasteurized milk, sterilized milk, or canned milk may be substituted for it when clean fresh cows' milk cannot be obtained.

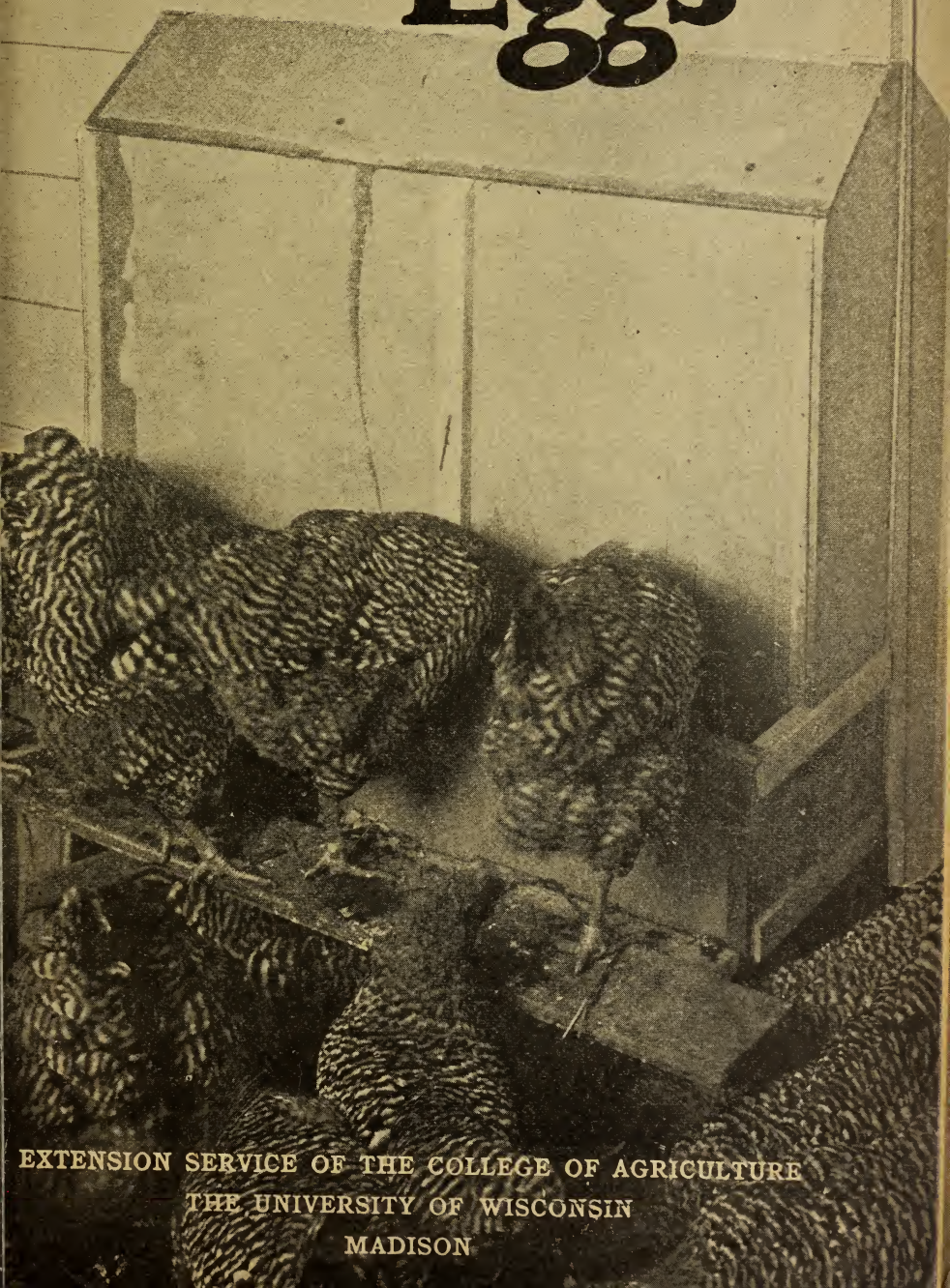
Lowered nutrition in children means decreased vitality and lowered resistance to disease. If the nutrition of our children is impaired for any length of time, full juvenile development will be permanently arrested. Nor is the physical stunting of the race the only evil that serious undernourishment of our child population entails. Intellectual and moral abnormality are largely influenced by physical health, and a period of malnutrition among the children of America may easily be followed by a period of intellectual and moral deterioration.

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January, 1922

Feeding for Eggs



EXTENSION SERVICE OF THE COLLEGE OF AGRICULTURE
THE UNIVERSITY OF WISCONSIN
MADISON

TONICS

The use of tonics for the laying flock is a useless expenditure of money that should be discouraged. The same amount invested in good feed will bring better results. If one feels that a stimulant is necessary for the hens it can be supplied in the form of red pepper or ginger in the moist mash. Even this is not needed, for good mixtures, good hens and proper feeding methods eliminate tonics.

Feeding for Eggs

J. G. HALPIN AND J. B. HAYES

THE PROFIT FROM THE FARM FLOCK depends to a large extent upon how many eggs the hens lay. Hens will not lay well unless they are given the right kind of feed and, strange as it may seem, the average farm does not produce all of the feeds that are needed by the laying flock. It is poor management to get along with what one can produce when, by buying a few pounds of feed to supplement the home-grown feeds, the profits can be greatly increased.

The hen's diet should consist of grain, mash, animal feed, mineral feed and water. For the most part the flocks can utilize home-grown grain. During the winter this should always be fed in a deep litter of dry straw or other material, for in this way the hens will exercise to get their feed. Exercise keeps hens healthy and healthy hens lay. As a general rule the grain should be fed as a light feed in the morning and as a heavier feed toward night. A good rule is to feed half as much in the morning as at the afternoon feed.

ADD BY-PRODUCTS TO MASH

The mash is an essential part of the hen's diet, for she cannot make eggs economically from grains alone. In the mash should be included some of the common by-products such as wheat bran, middlings and gluten feed. These feeds are palatable and furnish relatively cheap vegetable protein.

The hen must be supplied with enough animal protein either included in the mash or fed in addition to it. Some of the more common home supplies of animal protein may consist of skim-milk, buttermilk or some form of waste meat and, in the summer, insects that the hen can find on her range. Repeated tests at this and other experiment stations have shown that hens cannot find the necessary amount of animal protein on the range to make

profitable egg production possible. Even in the summer unless the hens have all the milk they can drink it will pay to have some additional animal protein in the mash. In the winter the hen will not drink enough milk to supply her needs and some addition should be made.

FLOCKS RELISH FRESH MEAT

In some sections of the state many farmers feed their flocks fresh meat during the winter with excellent results. This meat consists of various animals such as rabbits, muskrats (caught for their fur), calves not good enough to raise, worn-out horses or a farm animal that has been accidentally killed, badly injured, or that has died from some non-communicable disease.

In feeding such material care should be taken that the meat does not spoil. The best practice is to dress the animal just as though it were to be used for food and, if the animal is large, quarter it and hang it up in a shed where the meat will freeze solid and stay frozen until used. The best way to feed such material is to cut off a piece and run it through a bone grinder. The ordinary bone grinder will grind frozen meat and bone to the right size for best results. It is a poor practice to hang pieces of meat in the poultry house that will decompose. It should be borne in mind that ground fresh bone is excellent poultry feed and will pay for the grinding.

GUARD AGAINST POULTRY DISEASES

Some butcher shops have installed bone grinders and sell ground green bone. This is an excellent feed when fed fresh, but poultry offal must not be ground in because of the danger of transmitting disease to the flock. This is especially true of tuberculosis. Whenever a supply of green bone is purchased it should be spread out thin in a cold room. If left in a paper sack even in a room below freezing the center of the mass will heat and spoil. Green bone cannot be successfully kept in large quantities unless thinly spread.

In some sections the creameries are making cottage cheese for poultry feeding. This is a splendid feed and wherever it is available at reasonable rates it should be used. When cottage cheese is fed, the flock should be given all they will eat readily and no other form of animal feed will be needed. Condensed skim milk

and condensed buttermilk are also being used in some sections to good advantage. Some of the proprietary mashes offered for sale contain dried milk albumin and others dried buttermilk.

FISH TRIMMINGS GOOD IN WINTER

During cold weather, trimmings from fresh fish are cooked and fed to poultry with very good results. Several flocks in this state have been handled in this way for years. In fish feeding it is necessary to watch for excessive quantities of salt. One Wisconsin poultryman lost heavily because rock salt had been spilled accidentally into the barrel of fish waste. The salt looked like ice; and although a little salt is beneficial, an overdose will kill.

Whenever there is not an abundant supply of animal feed to be had on the farm or locally it will pay to use one of the by-products such as meat scrap, a good grade of tankage, or fish scrap.

Most farmers will find it necessary to depend on one of these during at least a part of the year. Being dry they can be stored away and will keep under ordinary storage conditions or can be mixed in with other feeds or placed in bins.

CHEAP SOURCE OF PROTEIN

It should be borne in mind when buying meat scrap or tankage that it is very high in protein so that although the cost per hundred pounds of material seems high, yet as a matter of fact a pound of protein can usually be had cheaper in the form of meat scrap or tankage than from wheat or corn. In addition, repeated tests have shown that a hen must have animal protein as a part of her diet in order to utilize the vegetable proteins to advantage. Unless sufficient animal protein is available a large part of the vegetable protein will not be used for building her body tissues nor making eggs.

Meat scrap or some other high protein animal feed should form one-fifth of the mash by weight. Where only a few hens are kept it will be found most convenient to buy a good commercial egg mash.

MINERAL FEED NECESSARY

Most poultry writers have looked upon grit simply as a help in grinding the feed but by tests at the Wisconsin Experiment Station it has been shown conclusively that an abundant supply of the right kind of mineral is as necessary for good egg production as any part of the ration. It is a common custom on many farms to neglect feeding oyster shells or other forms of shell

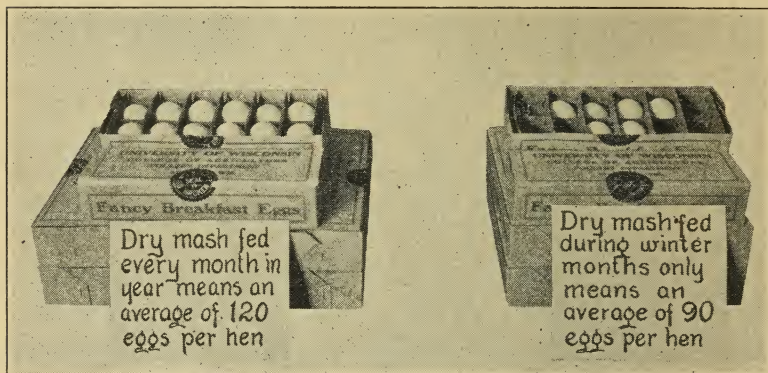


FIG. 1.—FEED DRY MASH EVERY MONTH IN THE YEAR

If dry mash is fed only during the winter months it means an average of 90 eggs per hen; when fed throughout the year, 120 eggs is the average for each hen.

material unless the hens lay soft shelled eggs. Tests at this station show that soft shelled eggs are not caused by lack of shell material, but if shell material is lacking the hens will limit the number of eggs to the amount of shell material available. Thus an abundant supply of shell material is necessary for heavy egg production. An ordinary mixed ration will contain considerable shell material but it will not contain enough. Shell material is relatively inexpensive so that care should be taken that the hens have a hopper well supplied with this material at all times.

In the following table is shown the comparative egg production of flocks of hens kept for periods of 300 days on the same ration with the exception of the grit or mineral supply. It will be noted that as a single source of shell material, oyster shell is superior to all others. In practice, however, it is found advisable to give the hens access to more than one kind of grit. It

is well, then, to give free access at all times to a hopper that contains oyster shell or clam shell and lime rock grit. A number of firms are manufacturing lime rock grit for hens so that it can be had in most parts of the state at a reasonable price. Dry bone in proper size is also desirable poultry feed but should not be depended on as a sole source of mineral matter.

Table 1 shows the egg production from flocks of twelve pullets kept under the same conditions on a ration low in lime but having free access to their respective grit material.

TABLE 1.—EGG PRODUCTION

Grit Material	First test	Second test	Third test
Oyster shell -----	1,606 eggs	557 eggs	976 eggs
Clam shell -----			916 eggs
Dry bone -----	1,633 eggs	507 eggs	
Lime rock -----	948 eggs	411 eggs	879 eggs
Quartz -----	577 eggs	221 eggs	324 eggs
Check -----	(1,610) eggs (1,530)	565 eggs	1,115 eggs

1. This experiment was conducted jointly by the Departments of Agricultural Chemistry and Poultry Husbandry.

2. In first test, ration contained meat scrap with consequent higher egg production than secured in later years on a less palatable ration.

3. Check lot had free access to oyster shell, lime rock, dry bone, and quartz grit.

Charcoal is fed to hens to help regulate the digestive tract. In some instances a flock will eat large quantities of charcoal while in other cases charcoal will not be eaten by the flock. If something happens to derange the digestive tract such as bad feed, then charcoal will be eaten greedily. It is good practice to have it in a hopper before the hens at all times.

HENS ARE PASTURE FEEDERS

Hens are not usually looked upon as pasture animals and as a matter of fact on many farms the hens are fenced away from good pasture. Successful poultry keepers find that a liberal supply of green feed increases egg production and helps to keep the flock in health. A heavy laying hen will not last long unless the bowels are kept in a laxative condition. And most poultry keepers find green stuff more practical than drugs in keeping the digestive tract in proper condition. Green feed also adds necessary bulk to the ration and apparently assists in the assimilation

of minerals. Hens running in a good range will usually lay eggs with better shell than hens kept in dry yards. The additional exercise is undoubtedly of benefit but some forms of green stuff seem especially helpful in forming good egg shells.

During the summer a good manager sees to it that the hens have good clover, alfalfa, or other pasture. In the fall and winter it pays to furnish a supply of green feed. Cabbage is a good feed for fall and early winter. Later in the winter mangels or other root crops can be used. Silage is good feed after the hens become accustomed to it. But in feeding silage to hens do not pick out the portion that is largely corn but choose a small amount of the leafy part that is cut rather fine. Place the silage in a feed trough or mix with mash. In a few days the hens will learn to eat it.

SPROUTS ADD COLOR TO YOLKS

Sprouted oats make splendid green feed for winter and spring use. They are especially good if placed in the sun so that the sprouts are green. The green sprouts will add color to the yolks making them richer yellow. This is desirable in some cases. It is not known now but there is at least a possibility that the dark yellow yolks are richer in vitamins. The Experiment Station has had difficulty in securing good sprouted oats all the time and has fed a good many oats that have just started to sprout—sprouts about $\frac{1}{2}$ inch long. These oats are sprouted as follows:

Secure empty lard tubs or large wooden pails. Bore a small hole near the bottom of each tub and make a plug to fit the hole. Put about half a pail of dry oats in a tub and add luke warm water to cover the oats to a depth of two or three inches.

After twelve hours pour off the water and empty the wet oats into another pail. After that morning and night empty the oats from one pail to another and fill with warm water, let stand five minutes, stir and drain by taking the plug out of the bottom of the pail. Keep the pails in a warm place and keep covered with a wet cloth.

The sprouts should be an inch or more in length in five days when they are ready to be fed, or they may be placed on trays in a warm place in the sun and kept moist for a day or two, when the sprouts will turn green.

It is a good plan to have several pails and start a new lot of oats each day. The pails should be scalded with hot water each time before starting a new lot.

There are several patented oat sprouters on the market that can be run with a lamp. With such a sprouting device one can produce longer sprouts and by putting the sprouted oats in the sun, can give the flock more coloring matter, with the result that the yolks will be a deeper yellow.

Although clover and alfalfa chaff are not succulent feeds, they make a very good addition in winter. Scoop up the chaff from the barn floor and put it in the hen house so that the hens can help themselves, or the chaff may be steamed with boiling water and mixed with mash feeds. Such chaff is frequently wasted by other animals and so long as it is not musty can be used by the hens to good advantage.

HENS NEED MUCH WATER

Unless hens are given all the milk they can drink, water should be supplied to the flock so that it is easily accessible at all times. Even then water may be found advisable. It is well to remember that there is about a pint of water in a dozen eggs and hens will not lay "dried" eggs. It is especially important that laying hens have water to drink as soon as they come off the roosts in the morning and again just before going to roost at night. Unsatisfactory results from lighting in some instances have been due to lack of water supply.

Following are some suggested rations for laying hens:

RATIONS FOR LAYING HENS

Number 1

Scratch Feed

Cracked corn	2 lbs.
Wheat	2 lbs.
Oats	1 lb.

Mash

Bran	100 lbs.
Middlings	100 lbs.
Corn feed meal.....	100 lbs.
Gluten feed	100 lbs.
*Meat scrap	100 lbs.

*Or substitute a good grade of tankage.

Feed at least one pound of mash to two pounds of the grain mixture.

Number 2

Scratch Feed

Cracked corn	3 lbs.
Wheat	1 lb.
Oats	1 lb.
Barley	1 lb.

Mash

Bran	150 lbs.
Middlings	150 lbs.
Corn feed meal	100 lbs.
Meat scrap	100 lbs.
or	
Tankage	100 lbs.

Number 3

Scratch Feed

Corn	3 lbs.
Wheat	1 lb.
Oats	1 lb.
Barley	1 lb.
Skimmilk or buttermilk to drink.	

Mash

Bran	300 lbs.
Middlings	300 lbs.
Corn meal	200 lbs.
Tankage	100 lbs.

Number 4

Scratch Feed

Corn	10 lbs.
Barley	3 lbs.
Oats	2 lbs.

Mash

Bran	300 lbs.
Middlings	200 lbs.
Oil meal	100 lbs.
Meat scrap	150 lbs.

Number 5

Scratch Feed

Corn	6 lbs.
Oats	2 lbs.
Barley	2 lbs.

Mash

Bran	100 lbs.
Middlings	100 lbs.
Ground corn	100 lbs.
Ground oats	100 lbs.
Meat scrap	100 lbs.

Number 6

Scratch Feed

Buckwheat	3 lbs.
Wheat	3 lbs.
Barley	2 lbs.
Oats	2 lbs.

Mash

Bran	100 lbs.
Wheat middlings	100 lbs.
Buckwheat middlings	100 lbs.
Ground oats	100 lbs.
Oil meal	50 lbs.
Tankage	100 lbs.

The rations shown above have been used by poultry keepers with good results. Other combinations can be worked out that will suit local conditions. The scratch feed should consist of the grains raised in the community with the exception of rye which should not be fed to poultry. It will be found profitable to sell rye and buy corn or other feed to replace it.

Corn should not be fed on the ear but should be shelled and fed in the litter. When convenient, corn should be cracked. As a rule hens like cracked corn better than whole and will get more exercise scratching it out of the litter. The fine meal from cracked corn must be sifted out and should be fed as a part of the mash. If this is not done much feed will be wasted and will become mouldy. Mouldy feed on the floor when eaten by the flock causes serious digestive disorders.

In the southern part of the state corn will be used as a large part of the scratch feed, while in the northern section wheat, oats, barley, and buckwheat will be used to a greater extent. In some sections such feeds as peas and soybeans may be used as a part of the ration.

The by-products for the mash will be determined largely by cost and availability. For instance, in some sections gluten feed may be secured to good advantage, but is not commonly used in other sections. The same is true of the animal protein feeds as meat scrap or a good grade of tankage are interchangeable in any of the above rations.

In some sections the farmers take their grain to the miller, who grinds it and adds the necessary high protein concentrates, such as meat scraps or tankage and bran, middlings, or other feeds that are to be had locally. In this way the farmer uses his own grain in so far as practicable and gets a well-mixed balanced mash.

METHODS OF FEEDING DETERMINES SUCCESS

Success with hens depends to a considerable extent upon the method of feeding. In general the best feeders plan to have their hens come down from the roost on to a dry floor well bedded with dry straw or other litter. Scratch feed should be scattered in this straw either the night before or else early enough in the morning so that as soon as the hens come down they will go immediately

to scratching in the straw for their feed. As a rule the morning feed should be light, not more than one-third or one-quarter of the daily grain allowance, so that the hens will get a maximum of exercise scratching for the grain. If too much is fed the hens will quickly fill their crops and go back to roost and not get enough exercise to maintain health.

There should also be a hopper in the house that is constantly supplied with a good dry mash. The grain feed should be limited so that the hens will eat at least a pound of mash to every two pounds of grain. If the hens do not eat enough mash, reduce the morning grain feed.



FIG 2.—GREEN FEED FOR THE HENS

Suspending cabbage from the ceiling keeps it out of the litter.

MOIST MASH AT NOON

At noon in the winter time it is well to feed a moist mash well spread out in a trough so that all of the hens can eat readily. Do not feed more than the hens will eat in 10 or 15 minutes. The mash should be moistened with milk if it is available; if not, warm water may be used. When fresh meat is cooked for hens the liquid should always be saved and mixed into the moist mash.

If it is not convenient to feed moist mash at noon, or where hens are kept in very large flocks making moist mash feeding difficult on account of crowding, then it may be omitted and good results secured if proper balance is maintained between scratch feed and dry mash.

Noon is also the best time to feed green stuff. Mangles are best fed by sticking them on a spike driven into the wall of the poultry house while cabbage may be suspended on a string from the ceiling. Sprouted oats or silage may be mixed with the moist mash or fed separately.

DON'T SEND HENS TO ROOST HUNGRY

Before the hens go to roost in the afternoon give them a liberal feed of grain in the litter. It is important especially in cold weather that all of the hens go to roost with full crops. If the hens do not get their afternoon feed and go to roost hungry it may take several days before the egg production will get back to normal. If a hen that is laying or about ready to lay goes to roost on a cold night with little or no feed in the crop, instead of continuing to increase the size of the immature yolks in her body, she may reabsorb some of the material from them. Having a good dry mash hopper in the house will keep the hens from going to roost with empty crops, but they will not fill their crops with the dry mash if they are expecting to be fed grain. On the farm if the flock has been missed they can be fed in the evening by lantern light.

The egg production and profits from a flock can be increased by the use of artificial light. The first tests consisted of turning on electric lights at 4:30 in the morning. It was found that the hens would come down off the roosts as soon as the lights were on and go to scratching for their feed. The egg production from the

lighted pens was more than double that of the unlighted pens for the months of December and January.

LENGTHENING LAYING HENS' HOURS

Since that time other experiment stations and hundreds of commercial poultry keepers and farmers have found that artificial lights in the poultry house during the short days pay a big return for the labor and investment. It is true that all of the high egg records that have been made at the University of Wisconsin have been made without the use of artificial light, but there is no doubt that the correct use of artificial light will increase the average egg production of a flock and that this increase will be at the time of year when eggs are highest in price. The practice of lighting the average farm flock either morning or evening will become common in a few years.

There are many successful methods of winter feeding and no one method can be said to be better than all others. The following plan is especially suited to people who are busy during the day. The house is kept well bedded with dry straw; there is a metal hopper that is kept constantly supplied with crushed oyster shell and lime rock grit. There is an elevated platform for the water dish and a self-feed hopper that contains dry mash so that the hens can help themselves at any time.

In the morning the flock is given a fresh supply of water. It is important that this be given so as to be available as soon as the hens leave the roost. The hens get down from the roost and begin scratching in the straw for the feed left from the night before. During the forenoon all of this feed should be cleaned up and considerable dry mash eaten from the hopper. At noon the hens are given a light feed of moist mash, preferably moistened with milk. The mash consists of the dry mash fed in the hopper with a small amount of fresh meat or green ground bone added. Some kind of green feed is also given at noon and if the weather is cold, hot water should be added to the drinking dish.

The evening feed of grain is fed about seven or eight o'clock by artificial light. For lighting the pen either electricity or a gasoline lantern will be found satisfactory if carefully handled. The ordinary kerosene lantern does not furnish enough light for good results. At the evening feeding, more grain is kicked into the litter than the hens are likely to eat so that there will be some left over

for morning. An abundant supply of water should be provided so that the hens can get down off the roost and scratch grain out of the litter to fill their crops, take a drink of water and go back to roost. This style of evening feeding requires about an hour of lighting each day and has given good results during the past five years of flocks of both hens and pullets.

For some people it will be found convenient to light in the morning, in which case lights should be supplied about 4:30 and kept going until daylight. Artificial lighting makes it possible for the hens to eat more and thus make more eggs.

When ordinary hens are fed only during normal daylight of the short days, they will not have enough feed in the crop when they go to roost to last them until daylight. By either morning or evening lighting the day is lengthened.

The use of lights both morning and evening has not been found generally satisfactory. Young chicks grow very rapidly under continuous lighting, but it has not been found practical with hens.

When morning lights are used one must see to it that there is feed in the litter so that the hens can go to eating as soon as they leave the roost. There must also be a supply of drinking water handy. In the late afternoon such flocks must be given a heavy feed of grain in the litter so that they will fill their crops with enough feed to satisfy them until the lights come on the next morning.

When discontinuing lighting in the spring, care should be taken not to make a sudden change, but gradually to shorten the period about ten minutes a day until no lights are used.

DAILY WINTER FEEDING SCHEDULES

1. No artificial light

7:00 A. M. (or earlier) One-third daily allowance of scratch feed in deep dry litter.
Fresh water.

12:00 M. Light feed moist mash.
Green feed.
Add hot water in coldest weather.
Gather eggs.

- 3:30 P. M. Two-thirds daily allowance of scratch feed in deep litter (earlier in day on shortest days—later as days lengthen).
Add water if necessary.
Gather eggs.
Keep dry mash, oyster shell and lime rock grit in self-feed hopper so hens can help themselves at any time.

2. Morning artificial light

- 4:30 A. M. One-third daily allowance of scratch feed in deep dry litter.
Fresh water.
- 12:00 M. Light feed moist mash.
Green feed.
Add hot water in coldest weather.
Gather eggs.
- 3:30 P. M. Two-thirds daily allowance scratch feed in deep litter.
Add water if necessary.
Gather eggs.
Keep dry mash, oyster shell and lime rock grit in self-feed hoppers.

3. Evening light

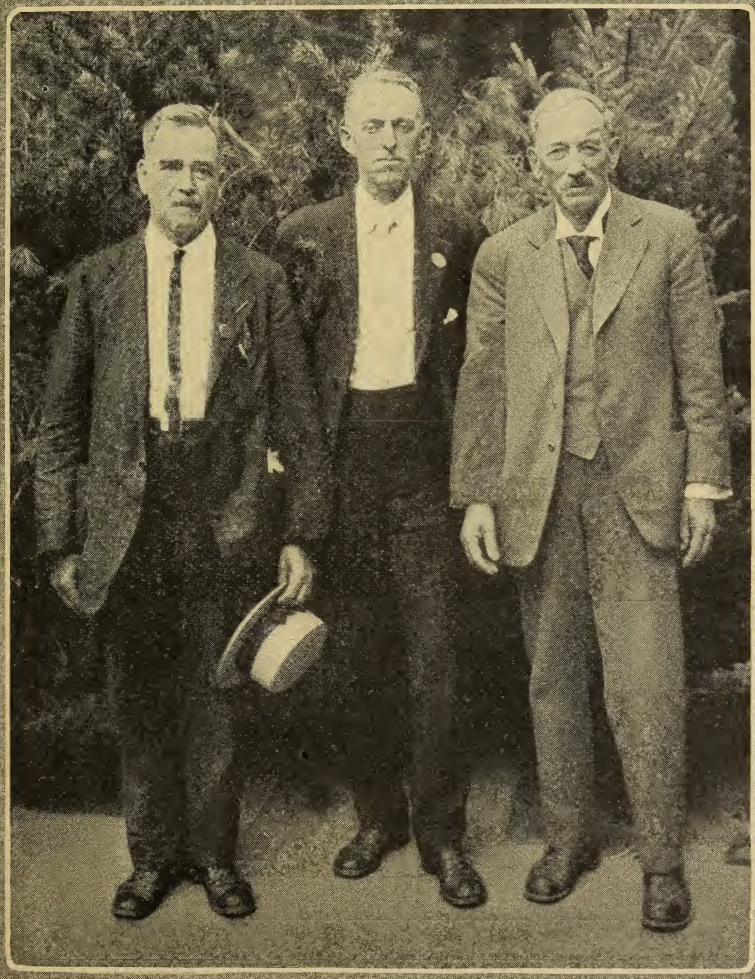
- 7:00 A. M. One-third daily allowance of scratch feed in deep litter.
Fresh water.
- 12:00 M. Light feed moist mash.
Green feed.
Add hot water in coldest weather.
Gather eggs.
- 7:00 P. M. Turn on lights and give heavy feed of grain in litter
- 8:00 P. M. Turn off lights and empty water dish on cold nights.
Keep dry mash, oyster shell and lime rock grit in hopper.

4. No moist mash

Use either No. 1, No. 2 or No. 3, but feed less than one-third of scratch feed in the morning.
Small quantity of scratch feed in litter at noon.
Remainder of scratch for evening feed.
On coldest days feed less scratch feed at a time and add an extra feed or two so as to encourage exercise.
Keep dry mash, oyster shell and lime rock grit in self-feed hopper.

APR 20 1922

A DECADE OF COUNTY AGENT WORK



E. L. Luther, Wisconsin's first county agent, is the central figure in the group on the cover page. On the right is A. W. Brown and on the left, Arthur Taylor. Both of these men are members of the first local agricultural committee for Oneida County.

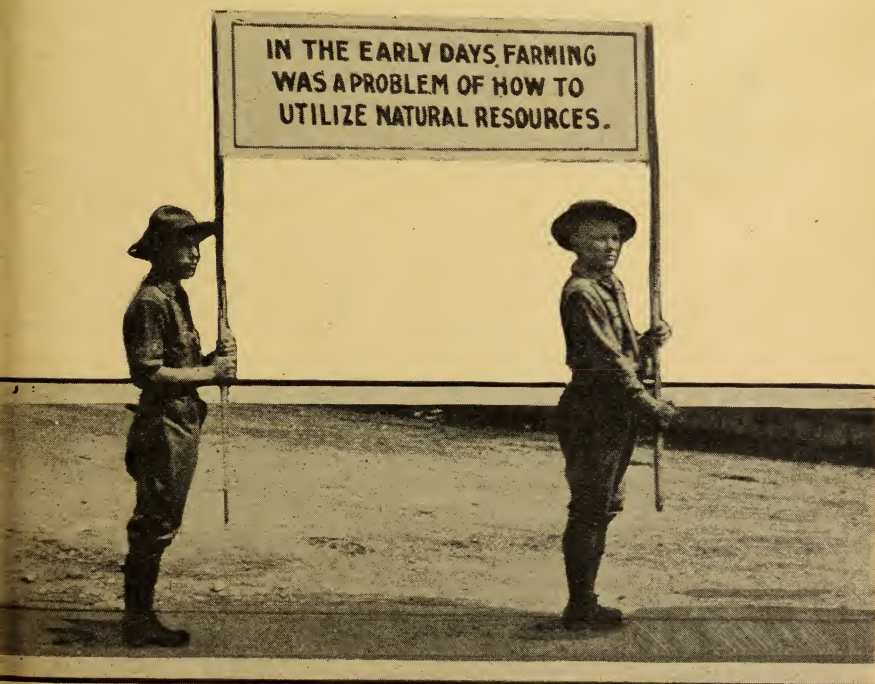
The local agricultural committee has administrative charge of the county agent work for the county. It has the same relation to the county agent that the school board has to the principal of schools.

A Decade of County Agent Work

H. L. RUSSELL AND K. L. HATCH

Education is a process of growth. Its progress is marked by centuries rather than decades, yet the results of agricultural extension work, which crystallized in the county agent system in Wisconsin but ten years ago, are already apparent. In no

The County Agent System in Wisconsin has had ten years of steady growth. Some of its activities were portrayed in pageant form at the decennial celebration held at Rhinelander in August, 1921. The "high spots" of county agent work were shown in graphic form by the floats appearing. For the benefit of the reader, portions of this parade are reproduced across the pages of this report.



other locality are these results to be observed to a better advantage than in

ONEIDA THE PIONEER COUNTY

Ten years ago, the "agricultural agent idea" had invaded the United States from the Canadian provinces on the North, where it had already become established. In Canada these men were called "itinerant teachers" from the fact that they taught classes in the high school in the winter and worked around among the farmers during the balance of the year. Their work with the farmer groups soon became so popular that they had little time to give to the teaching of classes. They were the middlemen active in carrying agricultural information from the producer, the agricultural college at Guelph, to its consumers—the farmers of Ontario.

When it became known that the University expected to "try out" the system in Wisconsin in a small way, Oneida County made application, by wire, for the first chance. In its November session in 1911, the County Board appropriated a sum of money sufficient to pay half the cost of carrying on this work—the University paying the other half.

The Training School Board, consisting of A. W. Brown, Arthur Taylor, and F. A. Lowell, the county superintendent of schools, in conjunction with the University, selected E. L. Luther, an educator of large experience, for this important



post. He began his work early in February of the new year, being the first county agent in the United States to put this work on a purely educational basis, free from commercial influence and the first to be paid for his service wholly from state and county funds.

Oneida County is now completing the tenth year of its experience with this system and the question may well be asked:

WHAT OF THE RESULTS?

In 1911, Oneida County was approaching the end of its extensive lumbering activities. Large tracts of cut-over lands were still owned by lumber companies who had given little attention to their agricultural worth. The rank and file were still depending upon the forest for daily bread. Few really appreciated the agricultural value of the land and its more or less dormant possibilities. Little interest was shown in the man who wrung his livelihood from the soil.

Agricultural progress in Oneida or elsewhere cannot be measured by the increase in the number of farms or of farmers. It can, however, be judged from the different attitude which now exists towards farming as an occupation, by the larger place which farmers are coming to fill in public affairs, by the material improvement among them, and by their constantly rising standards of living. These, after all, are the best measures of agricultural progress. It is by these units that the progress of the past ten years will be measured.



In Oneida County there were a few concrete problems to which the county agent applied his energies from the first and which have been consistently developed throughout the decade. Wisconsin had been signally successful as a dairy state. There was little doubt that dairying would succeed in Oneida County. The dairy industry furnished a ready market for the roughage that grew so profusely on newly cleared land; and it also provided a constant cash income for which the settler, deprived of the daily wage in the rapidly disappearing lumber industry, stood in need. Potatoes, too, grew well and yielded heavily. These should be the pioneer farmer's principal cash crop. On the lighter soils, rye could furnish the bread grain and in connection with dairying, pigs could most economically supply the meat.

It was to this program of work that this pioneer county agent turned his attention. Perhaps it was not so clearly defined as it is set down on these pages, but the ideals and the purposes were there.



The specific problems to which Mr. Luther addressed himself, therefore, were:

1. The improvement of the dairy cattle of the county;
 2. The use of better home grown feeds for dairy cattle;
 3. The better housing and care of dairy cattle;
 4. The production of more human food within the county;
 5. The making of Oneida a leading potato county;
 6. The development of better markets for farm products.
-

As a measure of the normal growth of this pioneer county, we have an increase of 60 per cent in its cultivated area. All other agricultural enterprises should on the average, without stimulus, follow this curve. And it is a striking fact that, with the exception of those included in the county agent's program, they do.

COWS DOUBLE IN NUMBER AND IMPROVE IN QUALITY

But while we have an increase of 60 per cent in the cultivated land, Oneida has had an increase of more than (from 2828 to 5940) 100 per cent in the number of dairy cattle. And



this is not all. Not only are there more dairy cattle per acre than 10 years ago, but they are of much higher quality. This is due in part to an increase of 2,000 per cent during the same period in the number of pure-bred bulls.

SILOS INCREASE AT RAPID RATE

Not only does Oneida County have proportionately more and much better cattle than ten years ago, but they are also much better housed and fed. This is shown by an increase from 7 to 126, or 1,800 per cent in the number of silos and an increase of 670 per cent in corn acreage, 70 per cent of which is used for silage.

Feed Improves Greatly. During this time the acreage of leguminous crops has more than doubled. This remarkable increase in the amount and quality of home grown feeds is paralleled by a corresponding increase in home grown foods.



MUCH MORE FOOD PRODUCED

Since 1911, the acreage of rye has increased 825 per cent, the number of hogs from 956 to 3,341 or 350 per cent, and the number of sheep from 256 to 4,843 or more than 1,500 per cent. All this is concrete evidence of the agricultural progress of Oneida County during the decade.

POTATOES SHOW REMARKABLE IMPROVEMENT

The potato crop of Oneida County has changed from its inconspicuous position and its promiscuous varieties to the finest seed potato crop in the world. The farmers of this county were among the first to develop pure strains of seed potatoes, disease-free and "certified." From growing "just potatoes" in the short space of ten years, there has been developed high quality seed potatoes by means of hill-selection and tuber-unit methods. Oneida County farmers have adopted the most advanced principles of scientific potato growing and the use of the most refined methods of potato culture. The first potato show in the state was held in Oneida County, and in the seven years since 1913, Oneida County has won first place **five** different times. Three of the largest seed potato farms in the country have been developed in Oneida County and from this county, potatoes have been shipped to practically every state in the Union.

To this extent and by these methods has Oneida County advanced its agriculture during the past ten years.



ONEIDA COUNTY PROGRESS DUPLICATED

The experience of Oneida County is typical of the work that has been accomplished or is now in progress in 55 other counties of the state, the extent of which is shown by the map on page 43.

FORERUNNERS OF THE COUNTY AGENT

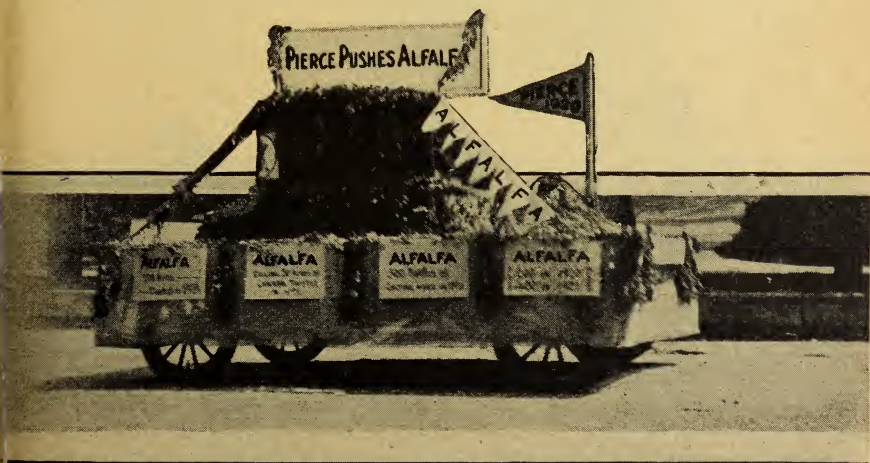
For many years prior to the adoption by the state of the county agricultural agent system, the agricultural college had sent its teachers out into the state to teach and to show farmers how to make use of the discoveries of the experiment station. Farmers' Institute workers were the first agricultural missionaries. They were followed later by so-called "specialists," because they had given special study to such problems as plant disease, insect pests, fruit growing, potato culture, and the like. Prior to 1911, the College of Agriculture had a score or more of these men who were giving part or full time to this work. During the decade of county agent de-



velopment, the demand for specialist service has increased until now more than forty such men and women are employed.

COUNTY AGENTS DISCOVER NEEDS

The efficient county agent soon becomes familiar with the agricultural needs of his county. He quickly learns that clover will not grow in certain places, that controllable pests are numerous and that unnecessary wastes and losses occur. He may not immediately know the remedy but he does know definitely that there are men and women at the college who are in a position to get the best available information. He thus discovers a demand for special service and wastes no time in an effort to secure it. Thus college specialists are kept busy assisting county agents with their special problems. It is team work that counts and when the farmers in any locality are able through their county agent to get the aid of a specialist who can bring them real help, then are improvement and progress made possible. Three discoveries are made. The county agents discover the men who need help, the farmers discover that help is obtainable, and the college specialists discover that through the county agent "middle-man" their usefulness is many times multiplied.



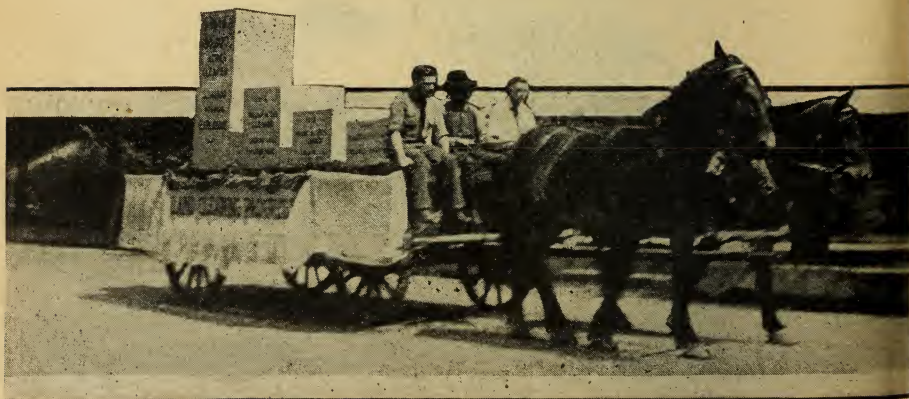
ALFALFA FINDS FAVOR

"In carrying out demonstration work on alfalfa the policy has been to work with county agents and to extend to these men on the firing line the fullest credit for such results as are obtained cooperatively," says L. F. Graber, alfalfa specialist.

Far beyond expectations has been the result of a single demonstration laid down on the Green County Asylum farm, three years ago. So marked were the results obtained from the use of ground limestone that 5,500 tons (180 carloads) of home-ground lime rock have since been used in that locality. This has saved the farmers in hauling and freight charges not less than \$12,000.

Harry Noble, agent in the adjoining county, grasped the idea and succeeded in putting to work a lime grinder that has prepared 2,400 tons during the past six months with fully 2,000 tons more in demand. For the five-year period prior to Mr. Noble's effort not more than 300 tons of limestone had been used in Iowa County.

Canada thistles are becoming a menace to many Wisconsin farmers. Demonstrations show clearly that this pest can be controlled and eradicated by seeding the plot to alfalfa. No less than 25 demonstrations are being carried on in other parts of the state to show the value of alfalfa not only as an enemy to Canada thistles, but also the general weed-killing power of this valuable crop for practically all farm weeds with the single exception of quack grass.



Alfalfa a "Depression-proof" Crop. In spite of a general lowering of prices, alfalfa has been practically "depression-proof." Alfalfa hay laid down in Wisconsin is at present quoted at \$18 to \$25 a ton, a price which makes the growing of alfalfa under favorable conditions one of the most profitable of farm ventures. Home grown alfalfa is protected by freight tariffs against competition of the West. The present acreage is 121,000 acres, an increase of 24,000 acres over last year and a total increase for the decade of more than 100,000 acres. This is a splendid showing considering that approximately 90 per cent of the crop is grown in 18 counties of the state.

BEEKEEPERS PLAN BETTER PRODUCTION AND MARKETING

For the past two years there has been a growing demand for beekeepers' organizations which would develop better methods of production and assist in finding more satisfactory markets for their product. Last year there were 34 active local organizations. To this number has been added 9 other associations, making a total of 43 locals, 29 of which are affli-



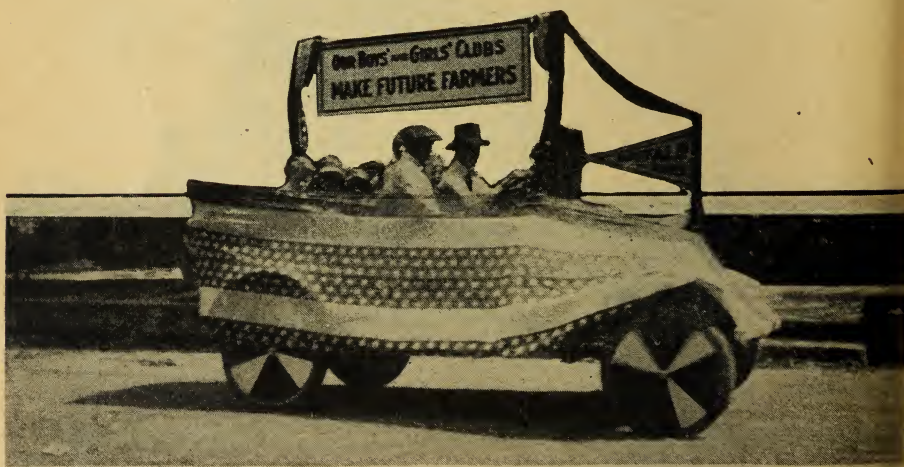
ated with the state association, which now has a total of 771 members.

Up to the present time the work of these organizations has been largely that of education. Thirteen three-day bee schools and 57 one-day meetings attended by 50 per cent of all the active beekeepers of the state, have been held during the past year. The next step to be taken by these associations is that of assembling and grading their honey products for more efficient marketing.

BOYS' AND GIRLS' CLUBS DEVELOP BETTER FARMING

Every field of agricultural practice is open to the children who belong to Boys' and Girls' clubs. Some idea of the scope of this work may be gained from the list of their more important activities. Exactly 167 calves were exhibited by club members at the State Fair in 1921, and hundreds of others were shown at local fairs all over the state. Forty of the choicest of these were shown at the National Dairy Show in St. Paul, where Wisconsin boys and girls received over 60 per cent of the total prize money offered at the show, as well as the banner given by the show to the state making the best exhibit of boys' and girls' club work.

Seed corn clubs also have been a leading line of work for boys and girls. Washington County comes first with 87 boys



and girls, each raising from one to five acres of pure-bred seed corn; Rock County comes second with 75 entrants; and La Crosse and Winnebago Counties follow closely.

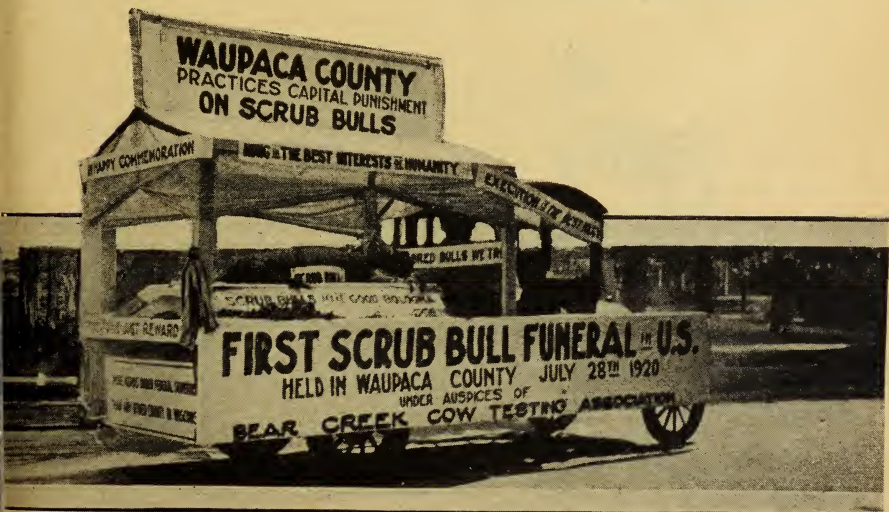
The extent and variety of the work may be judged from the enrollment of over 12,000 children in 15 different projects. Over 400 of these were encamped at the State Fair, and participated in the work carried on by 40 demonstration teams including up-to-date methods in canning, baking, and sewing.

The State Fair "round-up" affords an opportunity to get a "bird's-eye-view" of the work. It is the best means yet devised of focusing the attention of club members upon a single large objective toward which all boys and girls, no matter where they are or to what kind of club they belong, may strive.

In the past 10 years, this work has developed from a single-line of corn club work to its present magnitude embracing 15 different projects.

COW TESTING CONTRIBUTES TO DAIRY IMPROVEMENT

Nothing else has so stimulated the growth of cow testing associations as the work of county agents. The average production of the cows in these associations was 6,938 pounds of milk, and 264.5 pounds of fat, each. This means about 800



pounds of milk, and 16 pounds of fat each, over an average of the previous year and over 2,000 pounds of milk and 75 pounds of fat, above the average of the state at large as shown by census figures.

A brief glance at some of the other standards by which this work may be measured will only further emphasize its value.

The highest production of the year belongs to a grade Guernsey cow. She produced, at 12 years of age, 15,440 pounds of milk, containing 726 pounds of fat. Last year the honors went to a grade Holstein, who produced 16,742 pounds of milk, containing 689 pounds of fat or 37 pounds of fat less than this year's production. It is by the decided advance made in the records of the individual cows that the association records are steadily advancing from year to year. The Wisconsin Register of Production, to which 750 new cows have been admitted, each of which has produced more than 365 pounds of fat or "A Pound a Day" during the year, furnishes the necessary incentive to constant improvement.

The annual saving to members of these associations, through the cooperative purchase of feeds last year amounted to approximately \$15,000.

While only 38 per cent of the herd bulls of the state are pure bred, 94 per cent of those in herds belonging to cow testing associations are in this class.



No better evidence of the value of using a pure bred bull in connection with cow testing work can be found than in the case of Ben Muelenkamp of Monroe County. Ten years ago Mr. Muelenkamp bought his first pure-bred bull, but he soon discovered that a "scrap of paper" accompanying a bull was no guarantee of strong quality. Then he purchased a Guernsey animal of strong individuality and good pedigree. The value of the "get" of this bull is evident when the production of 10 of his daughters is compared with that of their dams. The records show that the daughters in every instance produced more than their dams, averaging 1,748 pounds more of milk and 119.7 pounds more of butter fat each.

At the present writing, 3,028 farmers owning 51,005 cows are members of these associations. Ten years ago the work was only fairly well launched, but under the leadership of the Wisconsin Dairymen's Association and through the active co-operation of all agencies it has attained its present magnitude.

Who will question the effectiveness of this work, or of its great economic value to the dairy farmers of the state?

DAIRY CATTLE DEMAND FROM OTHER STATES

Out-of-state demand for dairy cattle has been greatly influenced by falling prices, tight money, and a demoralized market. While the dairy farmer has fared better than his cash

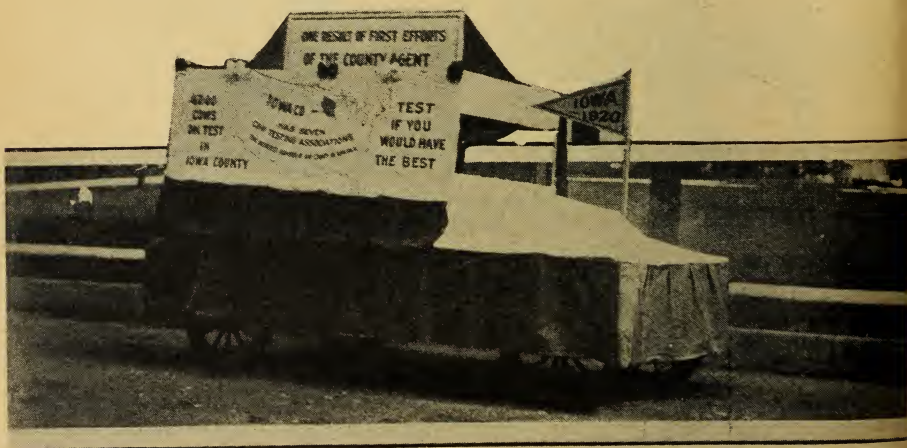


crop neighbors, yet the effect of falling markets and "hard times" was to make him a conservative buyer of pure bred stock. Nevertheless, the Wisconsin breeders have been assisted by county agents and live stock specialists in disposing of over \$500,000 worth of dairy cattle during the past year, to 22 different states and our neighboring republic of Mexico. When it is remembered that prices are less than one-half of those of last year, and that the farmer's purchasing power is correspondingly reduced, this is not an altogether unsatisfactory showing.

But the future contains a more hopeful outlook. During the war the South and West greatly expanded their cotton and wheat acreages. With the close of the war these farmers found themselves with a depleted soil, infested with pests, and a demoralized market. Temporarily drawn away from live stock farming by war demands, they are now turning to dairying as the best means of agricultural rehabilitation.

Already numerous inquiries are being received, regarding price, quality and supply of Wisconsin dairy cattle. It is certain that our breeders who can furnish good, clean, healthy cattle of quality and breeding will have no difficulty in disposing of their surplus stock at satisfactory prices.

County agents and extension specialists from other states naturally turn to Wisconsin as a reliable source of dairy cattle



for their farmers. The future reputation of the state as a dependable source of high class dairy cattle depends entirely upon the quality of the stock supplied; and Wisconsin county agents are being depended upon more and more to locate the sources of available supply. Thus is the outside demand being met and the reputation of the state protected. Before the advent of the county agent system, this was impossible. The whole process of organized marketing of dairy cattle is a development of the past ten years.

DRAINAGE DEVELOPS DORMANT LANDS

The county agents are important factors in selecting sites for drainage demonstrations. Twenty different projects, aggregating 285,000 acres, were examined by the drainage specialist during the year just closed. From these, 14 demonstration sites were selected for tile drainage systems covering 1,200 acres.

Of the larger areas under state supervision, 32 were examined and work planned covering 50,000 acres. Construction work is now under way on these projects which, when completed, will cost approximately a half million dollars and will add ten times the amount to the land values of the state. The first aim of the drainage specialist is to encourage the development of outlet ditches on the better marshes, and then to



induce the farmers to put in the tile drains necessary for carrying the surplus water to these outlets.

While this process of development is essentially slow, its results are certain. The Starkweather drainage district first examined in 1908 is typical. On the basis of the survey made at that time the feasibility was established. Next came the organization of the farmers in the district and the dredging of the outlet. This was followed by two or three years of disappointment until the farmers could be brought to see that supplementary tile drainage systems were necessary. In 1914, the extension engineer laid out the first farm demonstration and the neighboring farmers watched the results until at the present time, 1,200 acres in this area have been raised to the level of high production (80 bushels of corn to the acre for 1921). After the first demonstration has been made, the farmers are encouraged to hire an engineer to lay out the remainder of the systems. It is not the function of either the county agent or the extension engineer to carry this work beyond the demonstration stage, but it is their function to spread the gospel of good drainage and to show by the most efficient means available the results that can be obtained. The economic worth of this work can be easily calculated when it is known that during the past 10 years there has been completely



drained in this state over 80,000 acres, and that projects now under way will add 400,000 other acres to the production area of the state.

FARM ACCOUNTS FIND PRODUCTION COSTS

The farmer will never know the costs of his products until he keeps accounts. There is no other work that county agents can promote nor with which the specialist can assist that is as common in its scope, so unusually applicable to all farm enterprises, and so necessary at this time, as that of farm records and accounts. While the county agents are expected to assume local leadership in this field, cow testers, institute workers, agricultural teachers and local bankers are also asked to assist in its promotion. For 1921, there were three times as many account books placed in the hands of farmers as in any previous year, and it is believed that a higher percentage of these is being used.

In the "accounting schools" farmers are asked to bring lists of their property and are helped to fill out the original inventories, thus actually starting their own records. These "schools" are planned by county agents.



The cow testers take the lead in arranging with farmers to keep records which will enable them to know the cost of milk production. At present 36 farmers are keeping such records. These are being used by the College as the basis for a scientific study of "The Cost of Milk Production."

Falling prices of farm products and the high cost of things which farmers need to purchase have a tendency to discourage them from keeping accounts. These conditions have put many farmers off the income tax rolls. In reality, this state of affairs makes the keeping of records all the more essential since it is only by such means that the farmer can learn the source of his profits and losses and thus know what to produce and what not to produce.

While this phase of extension work has not as yet assumed large proportions, it is a development completely within the past decade.

FARMERS' INSTITUTES FULL OF INSPIRATION

County agents and extension specialists, working side by side with the practical farmer who is himself "doing things" on his own land are sure to make a strong presentation of up-to-date agricultural subjects. Silos, soybeans, and liming are used here to illustrate the value of this combination.

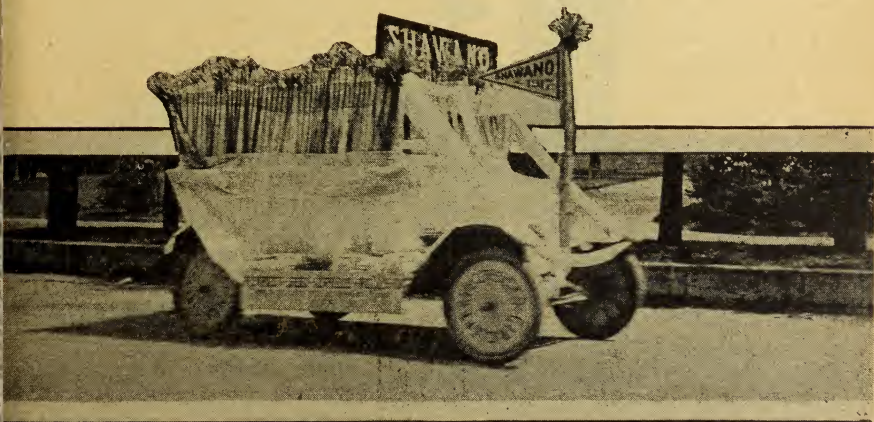


Ten years ago there were not more than 30,000 silos in the state. Farmers' institute workers were the pioneers of this movement. The best available data gives the state nearly 100,000 silos for 1921!

Ten years ago soybeans were unknown on the farms of Wisconsin. Few farmers had even seen them, and fewer still had ever grown them on their own land. Farmers' institute and college workers began to push soybeans for seed, hay and green manure in 1916. Since that time an ever increasing interest has been taken in this new legume, until today 18,000 acres are grown on Wisconsin farms.

Ten years ago the liming of acid soils was a comparatively unknown practice in this state. The development of the Truog tester, which soon found wide adoption by county agents and institute workers, gave soil acidity testing a great impetus. The result is that farmers are now buying ground limestone for use on acid soils by the trainload as well as grinding large quantities of local stone for the same purpose. One county agent reports 17 cars of ground limestone used in his county during the past year.

As a direct result of the "follow-up" work of the "light soils" institutes held in the sandy areas of the state, 549 soil samples were tested, 20 carloads of limestone ordered and 495 acres of soybeans grown! While the farmers' institutes were the pioneers of the extension movement and have been in oper-



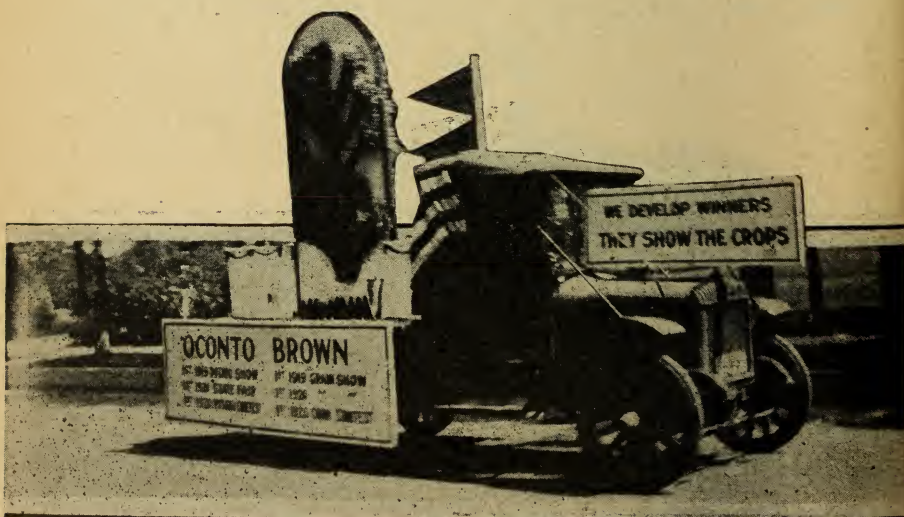
ation in Wisconsin for over 40 years they continue to furnish one of the chief sources of inspiration for improved agriculture as well as a ready means of actually taking the first steps toward such improvement.

FIELD CROPS THE FOUNDATION

Farm crops are the foundation of all agriculture. It is the crop that transforms the inert fertility of the soil into food for animals and men. Field crops have been made the basis of extension work since the earliest times. The advance that has been made during the past thirty years in the quality and yield per acre of Wisconsin's principal crops is completely summarized in our report for last year, entitled "Pages of Progress."

However, the work that has been done during the year just closed in the production of certain crops is deserving of special mention. Among these, soybeans stand out conspicuously.

The best available figures show that 18,000 acres of this comparatively new crop were grown in Wisconsin last year. Of this amount, 6,800 acres were grown alone for seed and hay, the balance being planted with corn to use for silage.



While this is a small acreage when compared with other crops, it represents 100 per cent over the previous year.

The methods used for the introduction of any new crop are as follows: First, the value of the crop for its various uses is thoroughly tested out by the experiment station. The results of these trials, if successful, are given to county agents and institute workers who, in turn, pass them on to the farmers of the state. Demonstration plots are then laid down on the farms of the leading farmers in various localities throughout the state. Auto tours are planned by county agents to enable these plots to be visited. Thus other farmers see the crop for themselves and learn the conditions most favorable to its successful growth. By these means the acreage of any valuable but hitherto unknown crop is rapidly expanded.

The hemp industry of the state is wholly a development of the past decade and rapid expansion of the alfalfa acreage during the same period has already been noted.

HOME DEMONSTRATION AGENTS

The idea of a county woman worker who should do for the women in the home what the county agent is expected to do for the men on the farm is an outgrowth of the county agent system. This idea has been generally adopted throughout the United States. It has not yet become widespread in Wisconsin, Marathon County being the only county now pro-



vided with a woman worker. The county nurse whose employment is now mandatory under the law must be provided for before the home demonstration agent is likely to be employed.

Under the leadership of Miss Mary Brady, the women of Marathon County have organized 25 "Home Makers' Clubs." Each of these clubs has undertaken some form of civic or social improvement. Community spirit is developed, community pride is stimulated, and direct improvement results. It is with these organized groups that the county home demonstration agent carries on the work of home improvement. The women's clubs lead in the campaign for hot lunches in schools, they meet to make old garments new, they see that the children of the community are weighed and measured in the child feeding "clinics," they assemble to study and to discuss questions of house management and sanitation. These "associations" of women do for women's work what breeders



and grain growers' associations do for agricultural improvement.

HOME GROUNDS PLANNING MAKES FARMS ATTRACTIVE

As the farmer rises in the economic scale he is anxious to improve his home surroundings, inspired by the same motives that move his city brother.

Here again the county agent discovers those farmers who wish assistance in the planning of their farm home grounds. While this work has been under way for but two years, results are already apparent in La Crosse, Winnebago, Chipewaga, Eau Claire, Waupaca, and Kenosha Counties.

In addition to demonstrations in artistic planting of home grounds, roadside planting has been undertaken in certain selected places along trunk highways, and advice given on planting of school grounds, country parks and tourist camps. In all, 24 such demonstrations have been permanently installed. This is a new piece of work, only two years old, and no large results have yet become available.

HOME ORCHARDS MADE TO PAY

While one of the first types of extension work to be undertaken by the College had to do with the care of the orchard, it was not until after the beginning of the county agent sys-

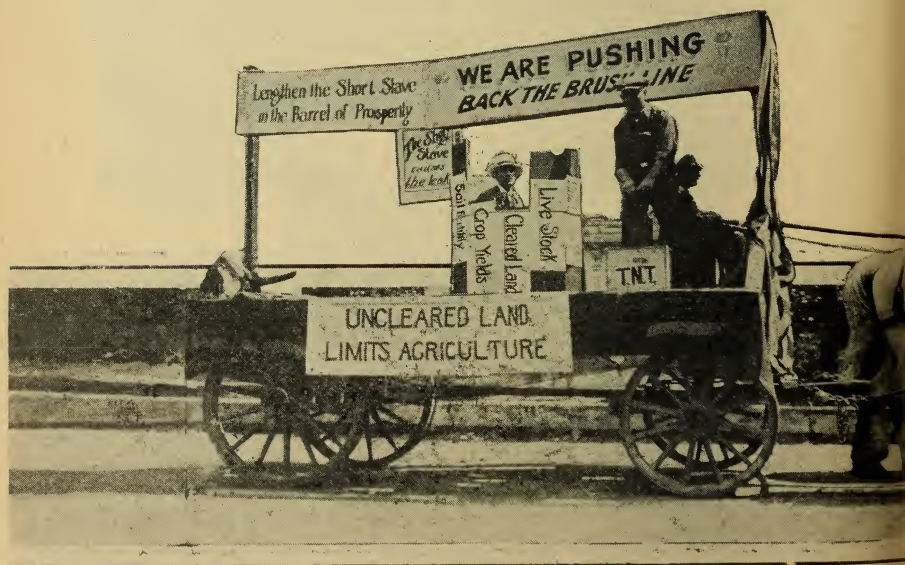


tem that pruning and spraying demonstrations came to be demanded by the farmers. Now, with one man devoting full time to this effort and working through the county agents, there is much more service requested than he can possibly render.

That this work is productive of large return may be judged from a few examples. Mr. Patzner, Grant County, says that the apple crop from his farm orchard will bring him \$750 this year. Heretofore it had returned scarcely \$50. Spring Brook Farm, Dodge County, will receive about the same amount from 200 trees, yet in former years the crop scarcely supplied a family of two. Chas. L. Hill, Fond du Lac County, won 20 first prizes out of 23 entries at his county fair after one year's work.

One prominent feature of this year's work was the demonstration exhibits at county fairs of fruit grown under right and wrong conditions in those localities where the work is being carried on.

Two new features were introduced this year. The one was the training of "pruning and spraying teams" for boys' club



work. The Mount Hope team rented five farm orchards, cared for them under the usual spraying program, and received over \$300 as their reward for the venture.

The other feature was a venture in marketing by Jefferson County growers. The plan included the production of superior stock, its proper grading and packing by the association, and an agreement with certain grocers to handle the product. The final problem was to interest the consumer which was done by the use of attractive window displays. The result is that the growers have been able to dispose of all their fruit at remunerative prices, the grocers are convinced that it pays to handle only choice fruit, and the consumers have learned that they can have good fruit at reasonable prices and strictly "Wisconsin grown."

During the year just closed, work of this kind was carried out on 11,000 trees in 181 different orchards of the state.

LAND CLEARING BY MODERN METHODS

It is significant that while the county agent system first developed in the "cut-over" district, land clearing did not make rapid progress until the College sent out its land clearing spe-



cialists. No better illustration of the need for fundamental research work as a basis for extension activities or the necessity for the specialist service to county agents can be found.

The problems of land clearing are three-fold. First, to convince the people of a county that their future prosperity is limited by the area of cleared land; second, to find ways and means of securing proper materials for land clearing when needed without waste and at the lowest possible cost; third, to use these materials and other necessary equipment in such a way as to produce maximum return at minimum cost. The first object is accomplished through meetings and farmers' institutes; the second through the organization of land clearing associations; and the third through the medium of demonstrations and land clearing schools.

Wisconsin in 1921 was allotted from salvaged war explosives about 700,000 pounds of picric acid whose value as an agricultural explosive had been clearly shown to the federal authorities. This was distributed to the farmers at cost of cartridging, packing and freight, so that it resulted in a direct

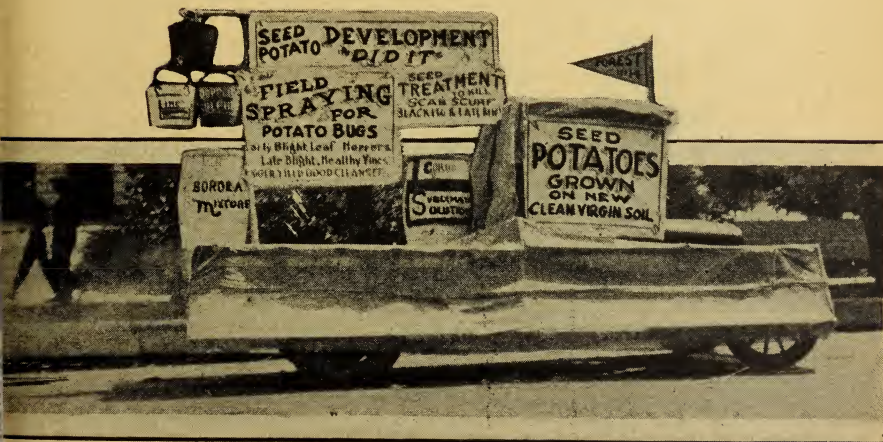


saving to Wisconsin settlers of at least \$100,000. Thus was a useless material converted into permanent agricultural values.

It is comparatively easy to measure the value of land clearing extension work. The amount cleared in 1921 exceeded that of 1920 by 35,000 acres, and the total amount of cleared land, directly traceable to the extension work of the past three years is not less than 135,000 acres. While this reflected in the increased production of this section, this production is not used to swell the nation's surplus, but to raise the standards of life among the settlers of the cut-over area. But more significant is the fact that from 1,500 to 2,000 new homes are established annually in which the occupant of the farm is at the same time a home owner and builder. While the problem of tenancy is continually growing more acute elsewhere less than 8 per cent of the farmers of upper Wisconsin belong to this class.

It is estimated that approximately six million pounds of explosives were used in 1920 and 1921 with actual savings as follows:

Saved on T. N. T.....	\$102,000
Saved on picric acid.....	100,000
Saved by better distribution.....	227,000
Saved by better selection and use of commercial explosives	80,000
Total	<u>\$509,000</u>



POTATO IMPROVEMENT WORK CONTINUES

With the adoption of the county agent system by the potato growing counties, came the opportunity to improve and develop the potato crop of these counties. The use of selected seed and the best cultural practices, the application of sprays for control of potato pests and the organization of growers for production and market purposes have constituted the principal lines of effort.

That improved practices have been generally adopted by Wisconsin growers is shown by the fact that 20 counties in the potato region used from 10,000 to 12,000 pounds of corrosive sublimate for seed treatment, an amount sufficient to treat from 400,000 to 500,000 bushels of seed. Five carloads of improved spraying machinery have been distributed during the year by one firm alone. Activity in these lines has followed in territory where field demonstrations have been made a prominent feature.

One new feature of this year's potato work was a tour throughout the potato section. Delegates from 25 counties took part in this tour covering a period of one week and making stops at 40 fields where splendid illustrations of proper (and improper) practices were to be seen. The most important result of this tour was the wider distribution of improved seed. Over five carloads of Triumphs were distributed in Marinette



County alone. Ninety per cent of the potato acreage of this county is made up of two varieties. The advantage of this from the standpoint of standard grades and carlot shipments is easily seen. Wisconsin is rapidly becoming as favorably known for its community centers of Green Mountain Triumph or Rural potatoes as it is for its Holstein and Guernsey cattle. This tour emphasized the need of continued work along the following lines:

1. **Further dissemination of improved seed.** Under the same conditions, these strains are out-yielding common stock from 20 to 50 bushels per acre.
2. **Continued emphasis on pest control.** Wisconsin growers are still taking heavy losses from faulty machinery, tardy application of sprays, and careless mixing of spray materials.
3. **The need for improved cultural practices.**

It is along these lines that potato extension work will be continued next year.

PLANT DISEASE CAN BE CONTROLLED

Most plant diseases can be controlled by one of the following methods:

1. **The use of disease resistant stock** such as the Wisconsin Hollander cabbage.
2. **The treatment of the seed**, as the formaldehyde treatment for grain smut.



3. **The spraying of the crop**, the common practice for control of apple scab and potato blight.
4. **The rotation of crops** as is usual in control of pea diseases.

Demonstrations of these methods have been carried on under the direction of extension specialists by county agents in all parts of the state. In connection with these, 88 meetings have been held which were attended by 5,892 people. Conditions favorable for the development of plant diseases and for their control vary so widely from year to year that it is impossible from crop yields to secure data with which to measure the effectiveness of this work. Illustrations of its value, however, are easily obtainable.

In one county 29 farmers used oat seed that had been sprayed with formaldehyde. Twenty-five of these reported their grain entirely free from smut, and the other four found only a trace.

In several cases the supposedly disease resistant Hollander cabbage was reported as badly affected with "yellows." These failures were all traced to a single lot of commercial seed and emphasized the necessity for keeping high class seeds pure and true to name.

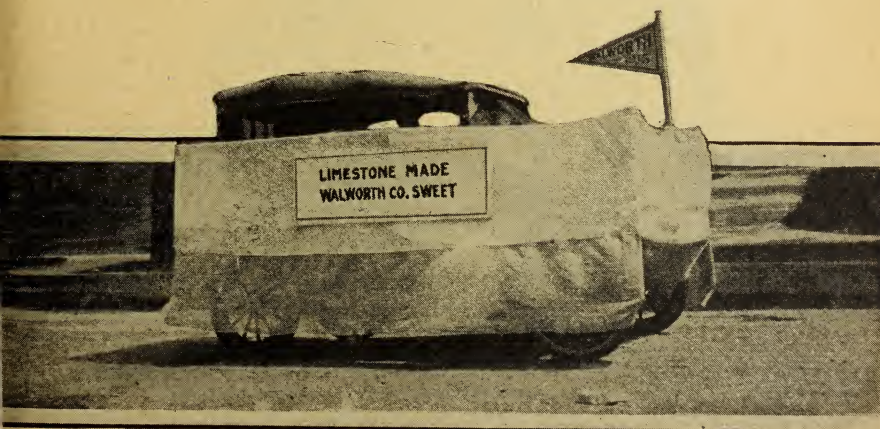


PORK PRODUCTION PROMOTED

Is more and cheaper pork for Wisconsin within the range of economic possibilities? It is believed to be:

1. Because of the economy of pork production when compared with other meats. Next to the dairy cow, the pig is the most economical producer of human food.
2. Because Wisconsin is particularly well adapted to hog raising. It has a large acreage of good pasture lands, a considerable quantity of dairy by-products and produces plenty of feed both to grow and to finish the animals and is very near the leading markets.
3. Because pork may be produced more economically :
 - (a) By raising better breeding stock ;
 - (b) By a wider use of pasture crops ;
 - (c) By raising larger litters ;
 - (d) By using self-feeders ;
 - (e) By feeding balanced rations.

Demonstrations in the more economical production of pork have been carried on for but one year and it is too early to note large results of this work. The beginnings that have been made have included exhibits at fairs, work with the care of the brood sow and litters, the use of self-feeders and pasture for pigs as well as a large number of lectures at farmers' institutes during the winter months on these subjects.



SOIL TESTS ALWAYS HELPFUL

Through close cooperation with county agents the soils specialists have introduced on Wisconsin farms during the year just closed over 16,000 tons of ground limestone for the correction of acid soils. They have made tests of 387 soil samples for the purpose of determining the necessary amount of lime to apply and given detailed examination to 32 farms as required in the work of the State Soils Laboratory. This is in addition to the 290 farms personally examined by other representatives of the laboratory, and the 1,200 analyses made by them.

The growing interest in the use of lime and sources of available supply is indicated by the fact that the laboratory has been asked to analyze 75 samples of limestone as compared with 20 samples last year, and 20 samples of marl as compared with six for the preceding year.

Demonstrations on the use of lime on sour soils, potash on marsh soils, and phosphate fertilizers on partially exhausted soils were carried out on more than one hundred farms scattered over the state. That the application of lime to acid soils



is a valuable practice can no longer be doubted from the results that have been obtained in those localities where its use has been advised.

A new phosphate fertilizer has just been introduced this year to Wisconsin farmers by these demonstrations. It is called "treble phosphate" because this fertilizer carries approximately three times the usual amount of phosphate. It was hoped that this high percentage would enable farmers to cut down their freight bills, but results thus far indicate that it is the equal of 16 per cent acid phosphate as shown on the 33 farms to which this fertilizer was applied.

The rather extensive use of lime, the growing demand for commercial fertilizers and the increasing interest in special methods of handling marsh soils is almost wholly a development of the past decade.

POULTRY PRODUCTION INTERESTS MANY

"Higher production per hen" has been the slogan of the poultry extension workers. Ever since the first county agent began his work 10 years ago, the College has had a poultry specialist who has devoted a large part of his time to exten-



sion work. In the last two or three years this work has been confined to two or three principal lines—as culling demonstrations, feeding and housing, and egg production contests.

The egg production contests were carried on last season on 78 farms. The average production of the highest and lowest flocks were 177.4 eggs and 101.8 eggs per hen, respectively. Each of these 78 farms has adopted the use of meat scrap or tankage with skim milk as the drink. On 14 of these farms, the best hens have been selected for the breeding pen. These are to be mated with a 200-egg cockerel and the eggs from this flock used for breeding purposes.

As a result of the high production which E. L. Henning of Oconomowoc has obtained from handling his flock according to this method, eight of his neighbors on adjoining farms have taken up the same breed. The entire community has been organized as a marketing association and all the eggs are pooled and sold in the same market at advanced prices.

In connection with the regular work and with farmers' institutes the poultry extension man has held 310 poultry meetings attended by 14,687 people during the past year. This



work has carried him into 75 per cent of the counties of the state.

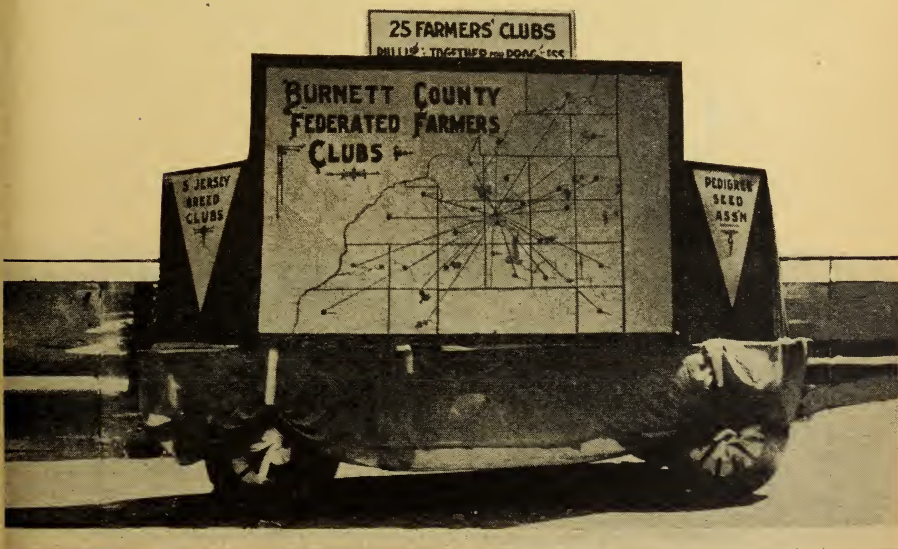
The only statistics available by which the value of poultry work may be measured are census statistics and the egg receipts at the principal egg markets of the country, which include Milwaukee, a strictly Wisconsin market.

The census figures for Wisconsin show an increase of 2,330,000 in the number of poultry, or approximately 25 per cent, for the past 10 years, while the country as a whole has increased its poultry production only 5 per cent.

The increase in egg receipts at the seven principal markets during the decade has been a little less than 7 per cent, while the increase in the egg receipts at the Milwaukee market has been over 25 per cent for the same period. Only one other market, San Francisco, shows an equal increase.

WOMEN'S WORK FOR THE HOME

Five specialists in various phases of women's work are now employed by the College. They assist the county agents and others in planning and carrying out work which is intended to



improve conditions in the home, covering the following projects:

1. **Child nutrition**, including hot lunches for rural schools.
2. **Clothing**, covering the buying of fabrics, home dressmaking, cleaning, dyeing, and remodeling old clothes, and the use of the paper dress form.
3. **Foods**, their preservation, preparation, and combination, and the planning of meals.
4. **House management**, including the furnishing of the house, its arrangement to minimize labor, the use of household conveniences and labor saving devices.
5. **Women's organizations**, to cover home makers' clubs, short courses for women and girls, milk campaigns, county surveys, and similar group efforts.

The work in **child nutrition** has revealed that large numbers of Wisconsin children are under-weight. The necessity for more hot lunches in schools becomes apparent. In many counties the number of schools serving hot lunches has increased 50 per cent during the past year. The average gain in the use of hot lunches in schools for the past year was 16 per cent. This was influenced by the "poster contest" among



school children, which greatly stimulated interest in the hot lunch. One little girl wrote, "I am glad you came to our school. We are having hot lunches every day now, and they taste fine. We have fun playing we are little women cooking, and we scurry all the other children out of the way."

In one county, where nutrition work was undertaken, with six rural schools, 30 per cent of the children were underweight; at the close of the school year this number had been reduced to 4 per cent.

The **clothing specialist**, working with the county agent, has been successful in gathering the women into suitable groups for this instruction. In one county alone, over 200 meetings were held by local leaders who had received their instruction from the clothing specialist. The paper dress form has received widespread adoption, over 1,600 such forms having been placed in use during the year.

The **food instruction** was given in 23 counties to 12,472 women.

The same plan of reaching the women of a locality through a meeting arranged by the county agent was followed in the **house management work**. The principal things emphasized in the 11 counties where work was carried on were:



The arrangement of the kitchen to save lifting and to save steps; the manufacture and use of the fireless cooker; the wheel tray for moving, instead of carrying food and dishes; and the necessity for running water in the home.

The county short course for girls so successful last year at Wausau was given in two or three other counties where it proved equally popular. In conjunction with the faculty of the La Crosse County Agricultural School, 20 young women were given short course instruction along the special lines mentioned in this report, the value of which is not likely to be over-estimated. As time and staff permit, this class of instruction will be expanded.

Foremost among the organizations perfected for women and children stands the milk campaigns which were pushed at several points for the first time this year.

Under the leadership of the Wisconsin Dairy Council and a special representative of the Dairy Division of the United States Department of Agriculture, a campaign was carried on in Madison, and later in Walworth County. The details of these campaigns are too numerous to be given space here.



The results of the Madison campaign are instructive and convincing. After studying the table below, no one can doubt the practical value of educational work rightly directed.

TABLE I—INCREASE IN MADISON SALES IN MONTH AFTER MILK CAMPAIGN (COMPARED WITH PREVIOUS YEAR).

Month	Quarts	Pints	Total (Including bulk milk)
April -----	20 per cent	*17 per cent	17 per cent
May -----	25 per cent	3 per cent	22 per cent
June -----	31 per cent	7 per cent	26 per cent
July -----	35 per cent	14 per cent	36 per cent
August -----	30 per cent	15 per cent	27 per cent
September -----	37 per cent	12 per cent	31 per cent
October -----	32 per cent	13 per cent	27 per cent

*Loss for April only. Many pint customers ordered quarts instead.

Note: These figures were furnished by the largest milk distributor. During the same period there was an increase of ten in the number of small dealers.

It must always be borne in mind, however, that much of this work is of such character as to make it impossible to secure data by which it can be quantitatively measured, yet its results may be infinitely more valuable and far-reaching.

LABORATORY SERVICE FOR FARMERS

The past decade has seen complete development of certain types of laboratory service which the College of Agriculture has made available to Wisconsin farmers. During the past year alone, 1,043 blood samples were tested by the veterinary department for the detection of contagious abortion. In addition to "blood tests" already mentioned, 638 specimens of tissue from diseased animals were examined for 208 veterinarians to determine if possible the nature of the disease with which these animals were afflicted. This veterinary service is wholly a development of the past few years.

Beginning with February, 1911, the manufacture of tuberculin has likewise grown from 20,000 cubic centimeters, the product of the first year, until the past year's production has reached the enormous total of a half million cubic centimeters. The total for the decade is 2,350,000 cubic centimeters, the equivalent of 1,200,000 doses. The tangible results of this service are seen in the 3,000 accredited herds that are now on the list and in the tuberculosis free areas which are being

rapidly developed in the state under the supervision of the state and federal departments of agriculture. The first county in the United States to have all its herds tested and thus made entirely free from tuberculosis is Barron County; and the economic worth of this work is seen in the demand that has immediately followed for Barron County dairy cattle as foundation stock.

With the development of interest in new legumes has come a demand for inoculation cultures, which the college laboratories have endeavored to supply at cost for the past five years. Material sufficient to inoculate seed for 31,500 acres has been sent out to Wisconsin farmers by the bacteriological laboratory during the year just closed.

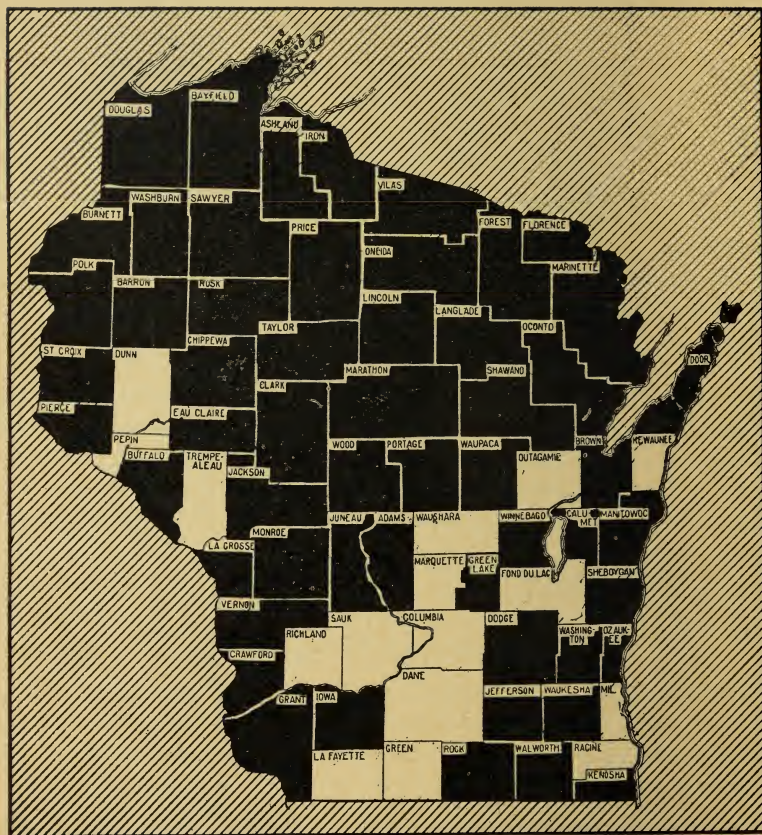
RAPID GROWTH OF AGRICULTURAL EXTENSION SERVICE

The Agricultural Extension Service itself is largely a development of the past ten years. It is true that much valuable work of a general character had been carried on for many years prior to that time, through farmers' institutes and other means, but the past decade has seen the complete development of the county agent system and the college corps of specialists, the carrying out of demonstrations on the farmer's own land, and the spreading of information thus gained through field meetings and auto tours, all of which are contributing to the up-building of the rural forces of the commonwealth.

The motto of the Agricultural Extension is "Service to the State," and while its work is essentially adapted to the needs of the farm family, it is constantly reminded that all classes can be contented, prosperous and happy only in direct ratio to the contentment, happiness, and prosperity of those engaged in agriculture, "our basic industry."

A list of Extension projects with assignment of specialists follows:

Subject	Name
Alfalfa.....	L. F. Graber
Beekeeping.....	L. P. Whitehead
Boys' and girls' clubs.....	T. L. Bewick
	E. J. Cooper
	Mildred Hagerty
	B. F. Zaffke
Cow testing	A. J. Cramer
	H. C. Searles
	Erwin Sutton
Dairy cattle sales.....	A. O. Collentine
Drainage.....	O. R. Zeasman
Farm accounts.....	J. S. Donald
Farmers' institutes.....	E. L. Luther
Field crops.....	R. A. Moore
	George M. Briggs
	E. J. Delwiche
Home economics.....	Mrs. Nellie Kedzie Jones
	Elizabeth Miller
	Gladys Stillman
	Gladys Meloche
	Sadie McNulty
Home grounds improvement.....	F. A. Aust
Home orchards.....	F. H. Gifford
Land clearing.....	John Swenehart
	A. C. Fiedler
Plant disease.....	R. E. Vaughan
	J. W. Brann
Potato improvement.....	J. G. Milward
Poultry.....	J. B. Hayes
	D. H. Reid
Pork production.....	L. H. McKay
Soils.....	Griffith Richards
	F. L. Musbach
	H. W. Ullsperger



THE PRESENT STATUS OF COUNTY AGENT WORK IN WISCONSIN,
JANUARY 1, 1922.

All counties in black have county agents. Of those remaining, Dunn, Milwaukee and Racine have county agricultural schools.

"In the visits I made to the various states, I found the extension work to be uniformly successful. Much of this success is due to the publicity side of the work, which is conducted with a deep understanding of the American temperament. The popular leaflets and bulletins are attractively printed and illustrated, and deal with almost every conceivable aspect of agriculture. One that comes to my mind at the moment is entitled, *What Name for the Farm?* This apparently trivial subject is treated in a most interesting manner, and concludes with an extensive list of words from which the farmer can make his own selection. After this it was no surprise to me to find flourishing 'Departments of Agricultural Journalism' at most of the agricultural colleges."

B. A. Keen.

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of Agriculture cooperating.

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Ag. Sem.

March, 1922
7 1922

BACTERIA FOR LEGUMES



EXTENSION SERVICE OF THE COLLEGE OF AGRICULTURE
THE UNIVERSITY OF WISCONSIN
MADISON

WILD LEGUMES OF WISCONSIN

Lead-plant, Wild Tea, or Shoestrings. False or Bastard Indigo, or River Locust—Pitcher's Hog Pea-nut. Wild or Hog Pea-nut—Ground nut or Wild Bean—Cooper's Milk Vetch. Carolina or Canadian Milk Vetch. Ground plum—Large-bracted Wild Indigo. Large White Wild Indigo. Blue Wild or Blue False Indigo—Partridge Pea. Large-flowered Sensitive Pea, or Prairie Senna. Wild or American Senna.—Rattle-box.—Large-bracted Tick-trefoil. Hoary Tick-trefoil. Panicked Tick-trefoil. Canadian or Showy Tick-trefoil.—Honey or Sweet Locust, Three-thorned Acacia, or Black or Thorn Locust.—Dye-wood or Greenweed. Woad Waxen. Base Broom.—Wild or American Licorice.—Kentucky Coffee Tree.—Everlasting Pea. Beach Pea, Sea or Seaside Pea. Cream-colored or Pale Vetchling. Meadow pea or Yellow Vetchling. Marsh Vetchling or Wild Pea. Veiny Pea.—Trailing Bush-Clover. Creeping Bush-Clover. Prairie Bush Clover.—Bush-Clover. Slender Bush-Clover. Wand-like Bush-Clover. Round headed Bush-Clover. Narrow leaved Bush-Clover.—Wild or Perennial Lupine or Wild Pea.—Black or Hop Medic, Blackseed, Hop Clover, or Nonesuch. Toothed Medic or Bur Clover.—Yellow Melilot, Yellow Sweet Clover, White Melilot, White Sweet-Clover, or Honey.—White Prairie-Clover. Violet or Purple Prairie Clover. Hairy or Silk Prairie Clover.—Wild Bean or Bean Vine.—Locust-tree, False or Bastard Acacia. Clammy or Honey Locust or Rose Acacia.—Pomme Blanche, Prairie Apple or Turnip, or Indian Bread-root. Sainfoin Psoralea or French grass. Silver-leaf Psoralea.—Broom, Green or Scotch Broom, or Hogweed.—Trailing Wild Bean. Small Wild Bean.—Cat-Gut, Wild Sweet-pea, or Goat's Rue.—Yellow or Hop Clover. Rabbit-foot, Oldfield or Stone Clover. Least Hop Clover or Hop-Trefoil. Low Hop-clover or Hop-trefoil.—American or Purple Vetch. Carolina or Pale Vetch. Common Vetch or Tare, Pebble Vetch, or Spring Vetch. Slender Vetch or Smooth or Lentil Tare. Tufted or Cow Vetch or Blue or Bird Vetch.

Bacteria for Legumes

E. B. FRED AND AUDREY DAVENPORT



IF ALL THE CROPS THE FARMER GROWS, two families of plants are the standbys of the world, the grasses and the legumes. With these the farmer feeds the world.

The grass family, which includes the grains, is generally well known. Wheat, oats, barley, corn, rice, and the crops usually called grass or

hay crops are easily distinguished from other plants, but just what is meant by the term *legumes* is not always clear. The

What Are the Common Legumes?

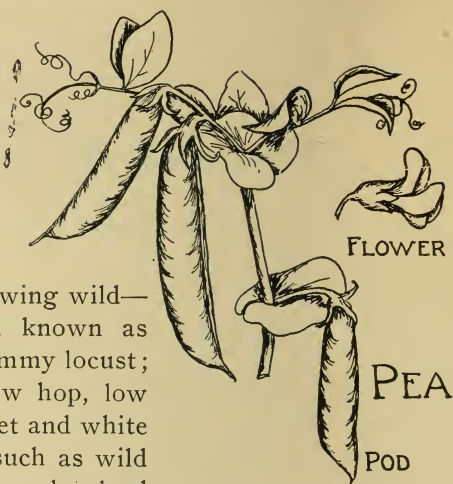
The common legume crops in Wisconsin are the clovers, mammoth, medium red, alsike, and white; alfalfa and the sweet clovers, both white and yellow; peas of the field and garden varieties, and closely related to them the vetches; the various garden beans; the soybeans; the cowpeas; and the lupines. Farther south the velvet bean, peanut, and japan clover are familiar names.

The number of legumes in plant life and their extent throughout the world is far greater than is commonly supposed. Several thousand species have been identified, ranging from the tiniest of plants to large trees.

Besides their well known value as food and forage and as soil improvers, some of the leguminous plants are the source of medicinal substances, dye stuffs, gums, and varnishes. Certain of the locust trees and some of the tropical trees furnish fine cabinet woods.

How Does the Cultivated Legume Benefit From the Wild Legume?

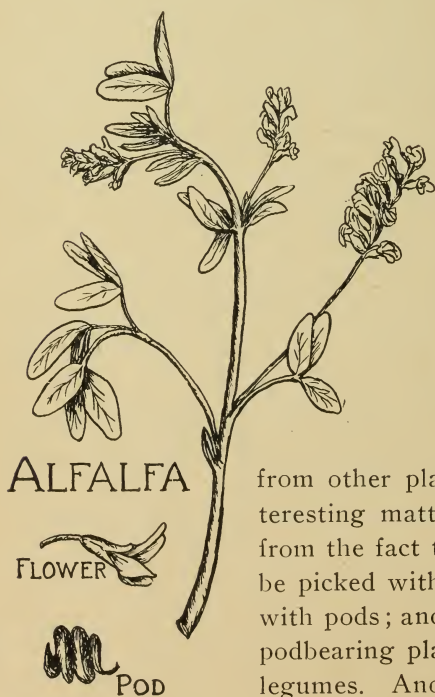
Not all common legumes are cultivated crops. In Wisconsin there are more than 80 varieties of legumes growing wild—some of them as well known as honey, common, and clammy locust; bush, bur, prairie, yellow hop, low hop clovers; yellow sweet and white sweet clover. Others, such as wild lupine, rattlebox, nonesuch, lead plant, Indian potato, catgut, tick trefoil, hog nut, ground plum, wild senna, everlasting pea, partridge pea, wild bean, and the vetchlings are not so widespread in the state. Many

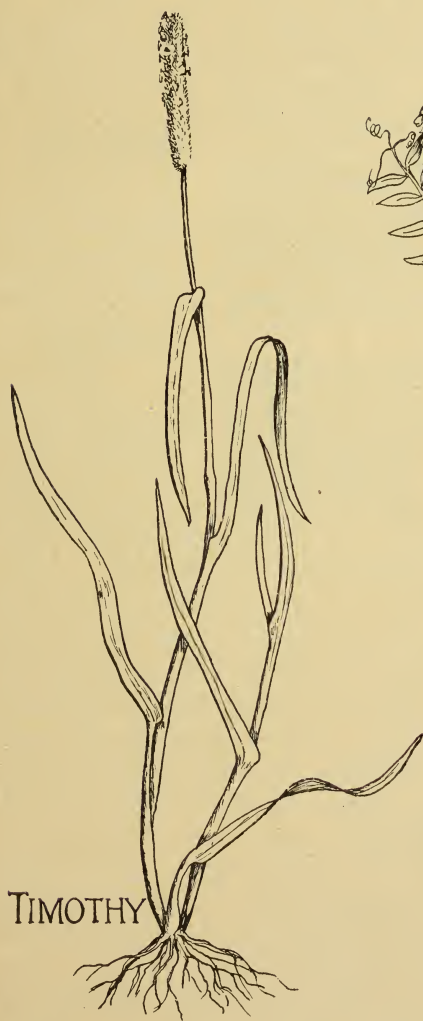


of these wild legumes, although of no market value, are valuable in that they have fostered bacteria in their nodules which are left in the soil, thus helping to make a friendly seed bed for their successors, the cultivated legumes.

How Do Legumes Differ From Other Plants?

To distinguish legumes from other plants is an easy and an interesting matter. They were so named from the fact that the fruit or seed could be picked without cutting, as is the case with pods; and hence the largest class of podbearing plants has come to be called legumes. Another characteristic which





TIMOTHY

A NON-LEGUME



VETCH

A LEGUME

distinguishes legumes is the blossom. One who examines the blossom of a pea or bean finds that the flowers are practically identical as to parts, although there is variation in the shape and size of the parts as well as of the whole blossom. A floret picked from a head of red clover or a cluster of alfalfa blossoms will show the same characteristics. This is true of the whole class of legumes. The leaves, too, show an interesting resemblance, each alternating on the stem with the one next it, and each leaf usually composed of leaflets, arranged along a common stem in pairs.



RED CLOVER



FLOWER

But the similarity that is of most importance and of greatest interest to the farmer is not in the blossoms, leaves, or fruit, but in the roots. Under normal conditions the roots of legumes have on them round or club-shaped growths of various sizes and arrangement. Some are smooth, some wrinkled, some round, and they may occur singly, or be clustered at the side of or surrounding the root. These growths are called nodules. When young they have a characteristic color which ranges from a

cream white to a pink or pinkish brown. These growths in contrast to the fibrous nature of the roots are delicate in texture and are filled with nutrient plant juices. They are easily separated from the root because the tissue connecting the two is comparatively fragile. They may be readily seen if the legume plant is carefully dug up and the roots are washed free from dirt.

What Are the Chief Characteristics of Legumes?

their protein content.

The importance of the nodule goes back to the most fundamental characteristic of legumes, the characteristic that makes legume crops one of the two great classes of plants, namely, their protein content. They are also very high in lime, and

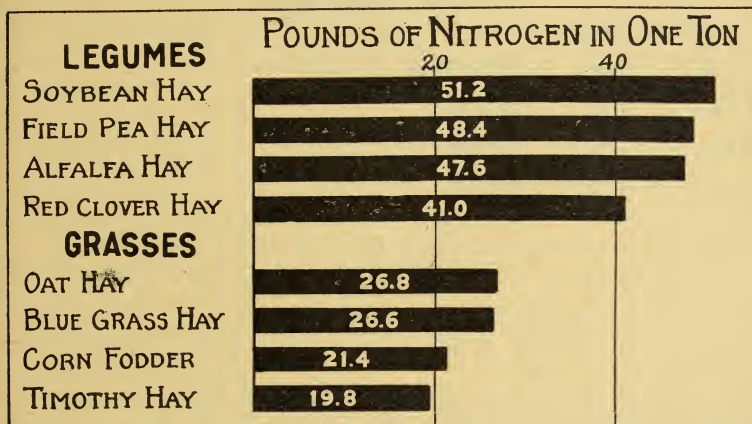


FIG. 1—THE AMOUNT OF NITROGEN IN LEGUMES AND NON-LEGUMES.

both lime and protein being body-building substances are especially necessary to growing animals and to those pregnant or giving milk. They are also high in carbohydrates, which makes them good sources of energy, and therefore, of value to the working animal. When we think of legumes as food and feed, however, we think first of their protein content, since they are in this respect superior to other plants.

What Is the Fertilizing Value of Legumes?

Aside from the food and feed value of legumes is their value as a fertilizing agent. Turned under as green manure the legume will contribute the largest possible amount of the expensive fertilizer, nitrogen, and this in a form quickly available for plant food. Fed to stock on the farm and returned to the soil as manure, there is still much nitrogen brought back to the soil by the legume crop. Cut off and sold, there is likely to be a loss in nitrogen fertility, although some nitrogen will be left in the roots in the soil, and the amount that will be

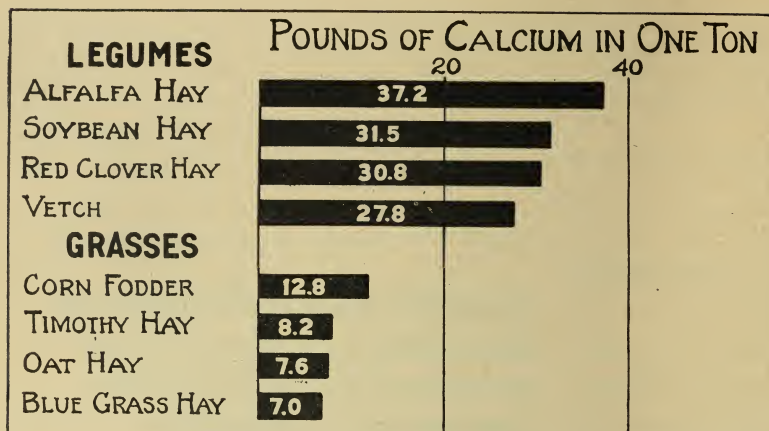


FIG. 2—THE AMOUNT OF CALCIUM IN LEGUMES AND NON-LEGUMES.

returned thus depends upon whether there are nodules on the roots.

What Is the Relation of Legumes to Nitrogen?

To be able to store up so much protein, which is the complex nitrogenous material in vegetable and animal substances, the legume must obtain an abundance of nitrogen as it grows.

The great difference between legumes and non-legumes is that the legume can, under the right circumstances, obtain nitrogen from the air. The non-legume, no matter what it may be, can obtain nitrogen only from the soil. It is in this connection that the root nodules become appreciated. Without them the legume cannot take nitrogen from the air. Worse still, the legume plant, needing more nitrogen than other plants, takes nitrogen from the soil if nodules are not present—not only the amount of nitrogen that a non-legume would take, but more. Thus the legume, without the help of the nodules, becomes a soil-robber, since it takes from the soil the important food, nitrogen, and takes it in larger amounts than do other plants. In a soil poor in nitrogen, the legume without nodules grows poorly or not at all.

**What Did the
Romans Know
About Legumes?**

As long ago as the early days of the Roman empire the fact that legumes were sometimes soil robbers was known, and for this reason the Romans called their chief legume the lupine, a name derived from their word for wolf, thus referring to the lupine's wolfish consumption of the fertility of the soil. On the other hand, one of the old Roman agriculturists noted that when a certain legume crop had long been grown in the same field, a non-legume following such a crop showed improved growth. These statements at first appear to be contradictory, but in fact they are illustrations of what takes place when a legume is grown without its essential bacteria, as in the case of the lupine, where the nitrogen for the plant's growth was all being taken from the soil; and when in the other instance the legume is grown with its essential bacteria, and is actually adding to the store of nitrogen in the soil as evidenced by the better growth of succeeding crops.

That the bacteria have anything to do with the nodules on the roots, or that the nodules have anything to do with the growth of these plants and their source of nitrogen is a later discovery. Still later, however, is the discovery that the bacteria may be grown in the laboratory and shipped wherever a farmer thinks his crop may need the bacteria to help it to better growth.

**What Is Natural
Inoculation?**

The presence of nodule-forming bacteria in a soil results in the formation of nodules on the roots of the plants, and the crop as well as the field is said to be inoculated. Natural inoculation—that is, the presence of bacteria in the soil which form nodules on roots of legumes—has come about gradually through years of legume cropping. How long these nodule-forming bacteria have existed cannot be told. No doubt the seed of legume plants as well as the plant itself carry a few of the bacteria peculiar to its root nodule, just as corn always carries the bacteria which cause this plant to ferment into silage when it is properly packed in a silo. Since the bacteria merely exist on the seed without multiplying at all, it is only when they are given the right conditions, that is, when they are planted in the field with the seed, that they increase in numbers. Their increase and

spread even in the soil is slow, and for this reason some method of introducing the proper bacteria is necessary.

The Pure Culture Method

Several methods of seeding the bacteria with the legume to be inoculated are in use; the one coming into most favor at present is the pure culture method. In this the nodule bacteria are cultivated under carefully guarded conditions in the laboratory and shipped when desired to the place where they are to be used. Such growths of bacteria are called pure cultures because only one kind of bacteria is present in any one culture. These cultures are applied direct to the seed shortly before they are to be planted.

The Soil Transfer Method

In addition to this method of planting bacteria, the transfer of soil from one field to another is sometimes used to insure bacteria for the newly seeded crop. Since the bacteria from one nodule-forming crop will inoculate another crop of the same kind, and since the bacteria under favorable conditions live for some time in the soil, this method is satisfactory, although clumsy and expensive, because of the labor necessary to move and spread large amounts of soil.

The Soil Glue Method

Still another method of inoculation is that in which the inoculated soil is applied direct to the seed to be sown, instead of to the field; in this method the seed are first moistened with glue and then coated with the finely pulverized soil. Inoculation with soil, however, always carries the risk of weed seeds, diseases, and insects, but it is a sure method of inoculation.

Is Sunlight Injurious to These Bacteria?

The question often arises whether sunlight is injurious to these bacteria. Experiments have been made which prove conclusively that soil, capable of producing nodules on legumes, can be exposed in thin layers to the direct rays of the sun until thoroughly dry and still retain this power. It is possible and very probable that some of the bacteria are killed by this treatment, and for this reason seed which have been inoculated with pure cultures of nodule bacteria should be dried away

from the sunlight since they are much more sensitive to light, heat, or drying when they are outside their natural home, the soil.

Is Frost Injurious to These Bacteria? Frosty weather does not seem to produce any apparent injury to these bacteria on freshly inoculated seed which are sown in the early spring. This would naturally be expected since these bacteria survive the extremely low temperatures of the winter months.

What Is Meant By Cross Inoculation? If all the different kinds of legumes were on equally friendly terms with all of the legume bacteria, inoculation would be a simple matter. As it is, bacteria that can work on the plant tissue of red clover roots and there produce nodules that will enable the plant to gather nitrogen from the air, are powerless to form these growths on alfalfa roots. But bacteria that live in alfalfa nodules will produce nodules on the roots of sweet clover (*melilotus*) and some of the wild legumes, and yet they are entirely ineffective on the roots of beans, peas, or soybeans. Bacteria from the soybean nodule do not produce nodules on any other of the common leguminous plants. Garden beans and garden peas each require their special bacteria. Even lima beans and navy beans cannot use the same bacteria. When an exception does occur to the rule, namely, that different legumes require different bacteria for nodule forming, those legumes which can use the same bacteria are said to cross-inoculate. For instance, alsike clover will develop root nodules if sown in a field that had previously produced a nodule-bearing crop of red clover. One can take bacteria from the garden pea, grow them in the laboratory, and by applying them to the seed of vetch, get a nodule-bearing crop of vetch.

Which Legumes Cross Inoculate? The following list gathers the legume plants into groups that cross-inoculate:

1. Red clover, mammoth red, alsike, crimson, Egyptian and white clover are all inoculated with the same kind of bacteria.

2. Alfalfa, white sweet clover, yellow sweet clover, bur clover, yellow trefoil, and fenugreek are all inoculated with the same kind of bacteria.

3. Garden pea, field pea, hairy vetch, spring vetch, wild vetch, broad bean, lentil, sweet pea, and perennial pea are all inoculated with the same kind of bacteria.

4. Cowpea, partridge pea, peanut, Japanese clover, velvet bean, lima bean, wild indigo, and tick trefoil are all inoculated with the same kind of bacteria.

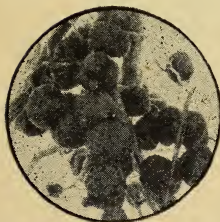
5. Garden, field, navy, kidney, and scarlet runner bean are all inoculated with the same kind of bacteria.

6. Lupines and serradella are all inoculated with the same kind of bacteria.

7. Soybeans are inoculated with the bacteria from the soybean nodule only.

SOME OF THE CULTIVATED LEGUMES

Red Clover. Mammoth red clover. Alsike, or Swedish clover. Crimson clover. White clover, or White Dutch clover.—Alfalfa. White sweet clover. Yellow sweet clover. Bur clover.—Cowpea. Lima bean.—Common garden pea. Field pea, or Canada field pea. Hairy vetch, or Winter vetch. Spring vetch. Sweet pea.—Soybean.—Garden bean. Navy bean, Kidney bean.—Lupine. Serradella.

RED CLOVER
NODULESALFALFA
NODULESSOYBEAN
NODULESPEA
NODULES

Do the Nodules of Different Legumes Differ?

Just as there are minor irregularities in the shapes and sizes of blossoms of the different legumes, so the nodules themselves show variations in shape and size, and even the bacteria within the nodules have slight variations depending on the legume in which they grow. The nodules on the bean plant are usually round; on the clover, oval; on alfalfa, club-shaped and often grouped in finger-like bunches; on the soybean, large and round. They may be scattered out over the root system, as in clover or alfalfa, or grouped along or near the tap root, as in the cowpea or soybean. They may be small, as in clover, or large, as in the soybean.

RED CLOVER
BACTERIAALFALFA
BACTERIASOYBEAN
BACTERIAPEA
BACTERIA

What Are False Nodules?

Other kinds of
nodular growths
may occur on the

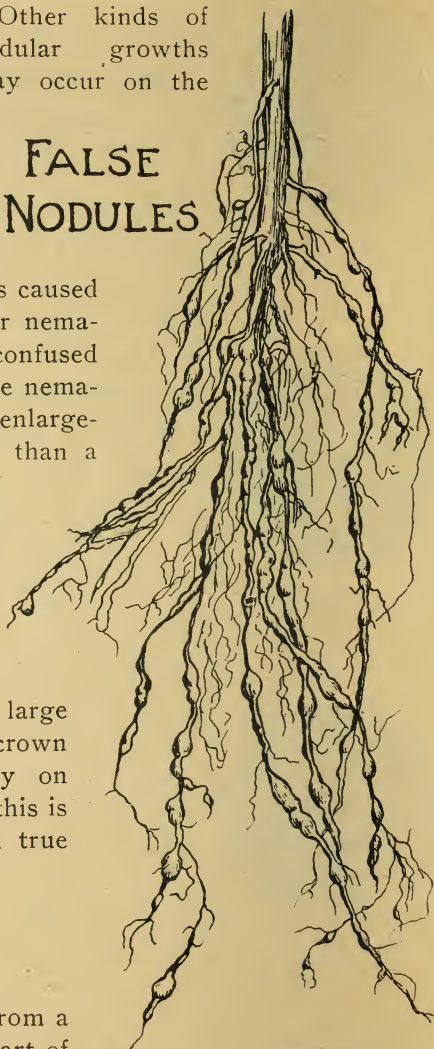
roots of plants, but the nodules produced by the nitrogen-fixing bacteria are termed true nodules and the others false. Of the false nodules the galls caused by parasitic eel worms or nematodes are most often confused with true nodules, but the nematode gall is a swelling or enlargement of the root rather than a growth at one side of or surrounding the root. In Wisconsin the nematode gall is rarely found out-of-doors and should cause little confusion.

Crown gall causes a large swelling at or near the crown of the root and usually on woody nursery stock, so this is not easily confused with true nodules.

How Do Bacteria Produce Nodules?

If one of the nodules from a legume is cut open and part of the inside is examined with a high-powered microscope, the legume bacteria are seen as numerous, minute bodies, X- or Y-shaped or rod-like, depending upon the plant from which they come. Each nodule contains billions of such bacteria.

FALSE NODULES



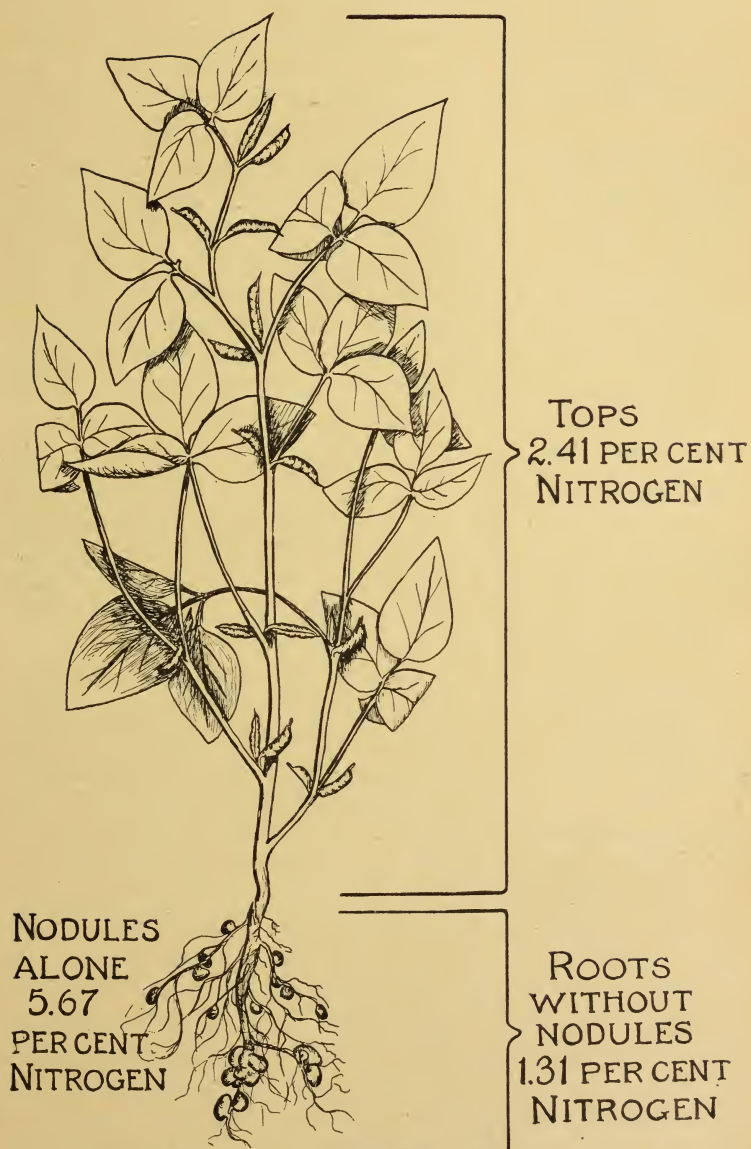


FIG. 3—DISTRIBUTION OF NITROGEN IN SOYBEAN PLANT.

These bacteria gain an entrance when they come in contact with the fine root or root hairs of their kind of plant; they enter and make the root build them a home. Here they grow and multiply rapidly until finally a nodule is formed. The bacteria get their food from the plant-juice. In return for their home in the nodules they repay

**How Is Nitrogen
Stored in the
Plant?**

the plant by giving it a continuous supply of nitrogen in a form that the plant can use as food, and they obtain this nitrogen from the air. The supply of nitrogen in the nodule itself is greatest when the plant is just ready to blossom; from that time on it grows less, until, when the seed is fully ripe, the nitrogen in the nodule has practically disappeared. The loss of this element in the nodule is, of course, a gain to the plant.

About the time the legume begins to form seed, which means that the plant is getting ready to die, the nodules cease to grow, they lose their plump appearance, they shrink, and eventually decay. The decay of the nodules returns the bacteria to the soil. Here they remain for a considerable time, ready to enter another plant and repeat their work.

**Is It Always
Necessary to
Inoculate?**

Given a sufficiently long residence in a field, a legume will develop nodules without artificial inoculation. Seed may assist this process of inoculation by carrying bacteria to the soil. The presence of certain wild legumes that cross inoculate with the cultivated crop also helps out the process of nodule formation. For this reason, when a crop has been part of the farm rotation for years, as the red clover in southern Wisconsin, the soil is probably well inoculated and hence artificial inoculation is probably not necessary. But seed the same field to alfalfa, and the clover bacteria are powerless to aid the new crop. With plenty of nitrogen in the soil as a result of green manuring or pasturing the clover, the alfalfa may thrive, but it will be at the expense of soil fertility. The same statements hold for soybeans when sown in sections where clover has been extensively grown, for the soybeans can benefit indirectly from the clover bacteria only from the supply of nitrogen which has been left in the soil. It is the newness

of soybeans and alfalfa as Wisconsin crops, not any lack of suitability to the soil, that makes artificial inoculation more necessary for them; experimental work with these two crops was not begun in Wisconsin until as recently as 1898, while clover has been an established crop here for as long as fifty years.

Waiting for natural inoculation is, at best, a slow process, and one that takes needless toll of the soil nitrogen; for the first few crops of a legume, not having the bacteria, cannot form nodules and cannot, therefore, use air nitrogen. Earlier farming, which did not demand the yields of the present day and which did not take into account the possibilities of exhausting the soil, might afford to wait on nature. Progressive farming, in the face of high costs of production, must make the most of the soil and yet cherish it as the most precious material possession of the farmer and his most valuable bequest to his children. When it is desired to get the largest possible yields from legume crops at the least possible expenditure of soil fertility, and at the same time to remove a large element of risk from legume crop production, it is advisable to plant bacteria with the seed.

Whether or not there should be this inoculation of seed whenever a legume crop is to be sown depends upon the extent of inoculation shown in the crop the last time that legume was grown in the field, and upon the length of time the bacteria will continue to live in that particular soil. To make sure that a crop is well inoculated, it is necessary only to dig up the plant, roots and all, and examine the roots carefully for nodules. If plants from different parts of the field show a considerable number of nodules, it is safe to assume that the crop is well inoculated. Inoculated plants in one section of a field do not necessarily indicate complete field inoculation. It has been found that legume bacteria have, of themselves, almost no ability to move. Practically all their movement in the soil is due to the movement of soil water, the rate of motion depending upon the amount of water and the type of soil. Bacteria spread most quickly in a sandy or light soil and most slowly in a heavy clay soil. The question at the next seeding after inoculation is whether or not the soil is in such condition that the bacteria may be expected to have lived over in the soil.

**How Long Do
Legume Bacteria
Live in the Soil?**

The kind of soil and its reaction, the temperature and moisture, all determine the length of life of the legume bacteria. In a fertile silt loam neutral soil, soybean bacteria have been known to live more than 18 years, but as a rule the number of legume bacteria in a soil free from legumes decreases rapidly after two or three years, and in an acid soil the disappearance is even more rapid.

**Is It Ever Necessary
to Inoculate
Red Clover?**

In the case of red clover, for example, a naturally inoculated crop in most sections of Wisconsin, inoculation is advisable where the land is acid, badly run out or very sandy. In a run-out soil, various plant foods may be lacking. If the particular plant food lacking is nitrogen, inoculation is likely to assist in giving a good catch. Sandy soils contain less nitrogen than heavy loam soils, so the chance for the clover to thrive without nodules is less. Neither do bacteria survive as long in most sandy soils, since these are likely to be more acid and since they dry out more quickly, thus depriving the bacteria of the moisture they need for growth. Inoculation of red clover on such soils, therefore, helps to get a catch of clover. On the other hand, inoculation of the seed is no cure-all; for a soil that is too acid for the plant may also be too acid for the bacteria. If other plant foods necessary for growth are lacking in the soil, supplying only one of these, the nitrogen, by inoculation is not likely to result in a normal vigorous plant.

On heavier soils or on soils where red clover always gives a good stand, the only question is whether the crop is getting any nitrogen from the air or all from the soil. If it is coming from the soil, a condition which will be indicated by the lack of root nodules, the nitrogen supply of the soil is being needlessly exhausted, and in this case inoculation is highly advisable. Under other circumstances the only advantage is to make an apparently sure thing doubly sure.

**Does Soil Acidity
Affect the
Inoculation?**

Since the bacteria of most legumes do not long persist in an acid soil, it follows that one of the conditions of successful inoculation is proper soil reaction. To get the best results from inoculation and, in fact, from legume production, the farmer first investigates the acidity of the soil. Not all legumes are equally sensitive to an acid condition. For example, soybeans are fairly resistant to acid conditions of the soil; red clover has medium resistance; alfalfa is very sensitive. In other words, a field in which soybeans thrive may give only a fair yield of red clover, and may utterly discourage alfalfa, in spite of the fact that all three crops were inoculated. Liming of the soil to counteract the acidity is the first necessity. On the other hand, if liming is not possible, the field may still go into legumes if a more acid-resistant crop, such as soybeans, is seeded.

Inoculation is not a short cut to easy farming. An inoculated crop requires the same care in selection of seed, preparation of soil, tillage, and harvesting that an uninoculated crop does. The only difference is that inoculation prevents the loss of large quantities of nitrogen from the soil and removes some of the risk of growing the crop, at only the time and expense of treating the seed. The advantages of inoculation are: better legume crops of higher feeding value, an increase of nitrogen in the soil, and hence better succeeding crops of non-legumes. Investigations with alfalfa and peas show that inoculation produces a large increase in yield of dry matter per acre and in the percentage of protein in the dry matter. Not only does the crop utilize more nitrogen, but it appears to have an increased capacity to remove larger amounts of potassium, phosphorus, and calcium from the soil. Lime, or calcium, it is found, makes the effect of inoculation even more noticeable.

Although it may be objected that since inoculated legumes feed more heavily on the other elements in the soil, their effect is, in the main, to exhaust rather than to upbuild, it is also true that from a given amount of plant food the inoculated legume produces larger amounts of dry matter than do uninoculated plants. Hence, the inoculated plant more than pays for its board as compared with the uninoculated.

Is Inoculation Ever Harmful? No harmful effects from the use of pure cultures of bacteria have thus far been found. On the other hand, enthusiasts for inoculation may claim too much for the cultures, such as the prevention of pea blight, rust, and other diseases. Any such results must necessarily be indirect, following only because of the greater vigor of the inoculated plant.

Do Non-legumes Benefit From Legumes? Practical observations indicate that non-legumes benefit by the presence of legumes during the second year. It is even claimed that there is an increase in nitrogen in the non-legumes when grown with legumes. Undoubtedly the associated growth of legumes and non-legumes may be beneficial in so far as the non-legumes may absorb the soil nitrogen, thereby forcing the legume to fix more atmospheric nitrogen. Whether oats benefit by being grown with peas, corn by being grown with soybeans, and timothy by being grown with clover is still a question, but there seems to be little doubt that any of these non-legumes benefit by being grown the year following these, or any, inoculated legume crops.

What Are the Lasting Effects of Inoculation? In spite of the undoubtedly good results to crops of both the first and second year following inoculation, the true value of legume inoculation does not lie there. The permanent effect upon soil fertility of the growth of legume crops is the great point of interest to the farmer. It has been found that about 50 to 100 pounds of nitrogen is gained to each acre of soil when the crop is well-inoculated, the amount varying with the soil, the legume, and other conditions.

In a soil poor in nitrogen the legumes in an inoculated portion of a field are readily distinguished from those in an uninoculated portion by their larger size and greener color. In fact the poorer the soil, the greater the percentage of air nitrogen used, as compared with soil nitrogen, and therefore the greater the contrast in the different parts of the field. A comparison of the root systems shows that the inoculated plant leaves larger roots in the soil, an important fact, because of their high nitrogen content and their effect in lightening and loosening the soil.



FIG. 4—SOYBEANS ON SANDY SOIL.

The soybeans on the left were treated with pure culture of soybean bacteria.

How Much Nitrogen Does a Legume Crop Accumulate? Different amounts of nitrogen are added to the soil by different legumes. A three-ton crop of cowpea hay, it has been estimated, adds 86 pounds of nitrogen an acre; a 25-bushel crop of soybeans with $2\frac{1}{4}$ tons of hay adds 107 pounds of nitrogen per acre; a four-ton clover crop, 132 pounds. Estimates for crimson clover range from 135 pounds to 190 and even 200 pounds of nitrogen an acre. One report gives the gain from alfalfa as 200 pounds an acre; another gives the same amount for beans, and 170 pounds for vetch. At the time of harvest for soybeans, about 75 per cent of the nitrogen was found in the tops, and the remainder in the roots and nodules. In red clover the tops contain about 77 per cent of the nitrogen and the roots 33 per cent.

Do Legumes Replace Commercial Fertilizer?

It will be seen from these estimates of the amounts of nitrogen fixed by different legumes that the use to be made of the crop also determines how much nitrogen will remain in the soil.

In fact, the growing of legume crops has, in certain parts of Wisconsin, almost solved the problem of expensive nitrate as

fertilizer. While it is true that the application of a commercial fertilizer can put more nitrogen in the soil than can a season's legume crop, it is also true that few farmers are thus replenishing their soil. Other plant foods, phosphorus, potassium, and lime, being less expensive, are more likely to be applied.

**How Are Cultures
of Legume
Bacteria Prepared?**

Artificial cultures for legumes have been used since 1896. The cultures which are supplied by the Department of Agricultural Bacteriology of the University of Wisconsin are put up in bottles. The bottles contain a layer of jelly-like substance which is the food on which the bacteria live and grow until they are transferred to the soil with the seed. The jelly is made up of different materials which these particular bacteria have been found to prefer as food. Just as some plants prefer to grow in soil and some in water, so these legume bacteria when grown away from their natural home, the nodule, prefer to grow on a semi-solid material. They live longer on a food containing some liquid than on one which is dry. These cultivations of bacteria are called pure cultures, because the bacteria have been carefully separated from other bacteria and grown alone on a food, which has been previously sterilized to make certain that no other bacteria may grow there. Some persons speak of such cultures as purebred bacteria, but this is not true in the sense that purebred is true of animals and plants. Distinct families with long pedigrees of special service and potency are as yet unknown among bacteria. One advantage of pure cultures is, of course, that no harmful bacteria, soil or plant diseases, and no weed seed can be thus transplanted. The cultures can do no harm to either seed or soil, since they contain only the one kind of bacteria and these bacteria can do but one piece of work—that is, enable the plant to get nitrogen from the air. To make certain that no harmful bacteria enter, the greatest care is used in the laboratory and skilled workers prepare the cultures. Because of this necessity for watchfulness, farmers are advised not to attempt to grow their own cultures, or even to grow more bacteria by feeding those supplied in the bottles.

Of the many cultures for legumes on the market there are some that are claimed to contain fertilizing materials as well

as bacteria. In many cases traces of fertilizing material are actually found in the culture medium on which the bacteria are placed when they are sent from the laboratory, but the amount is so small that it is of no value. The only relation of these cultures to the fertilizing of the soil is in the help they give the plant toward getting nitrogen from the air and in storing this nitrogen in the plant from which it may later be returned to the soil. The term nitrogen culture is sometimes used in speaking of them, but this is not strictly correct, for the cultures contain no nitrogen; they contain only bacteria that will enable the plant to draw on the nitrogen of the air.

Some idea of the value of legumes for Wisconsin may be comprehended if the total acreage of these crops is considered from the point of view of the amount of the atmospheric nitrogen they are able to make use of. The figures below show the extent of these crops in Wisconsin for the year 1921:

Alfalfa	121,000	acres
Clover, alone	450,000	"
Clover with timothy.....	2,576,454	"
Soybeans, grain	3,500	"
Soybeans, for hay	4,500	"
Canning peas	59,800	"
Field peas	35,200	"
Beans	4,900	"

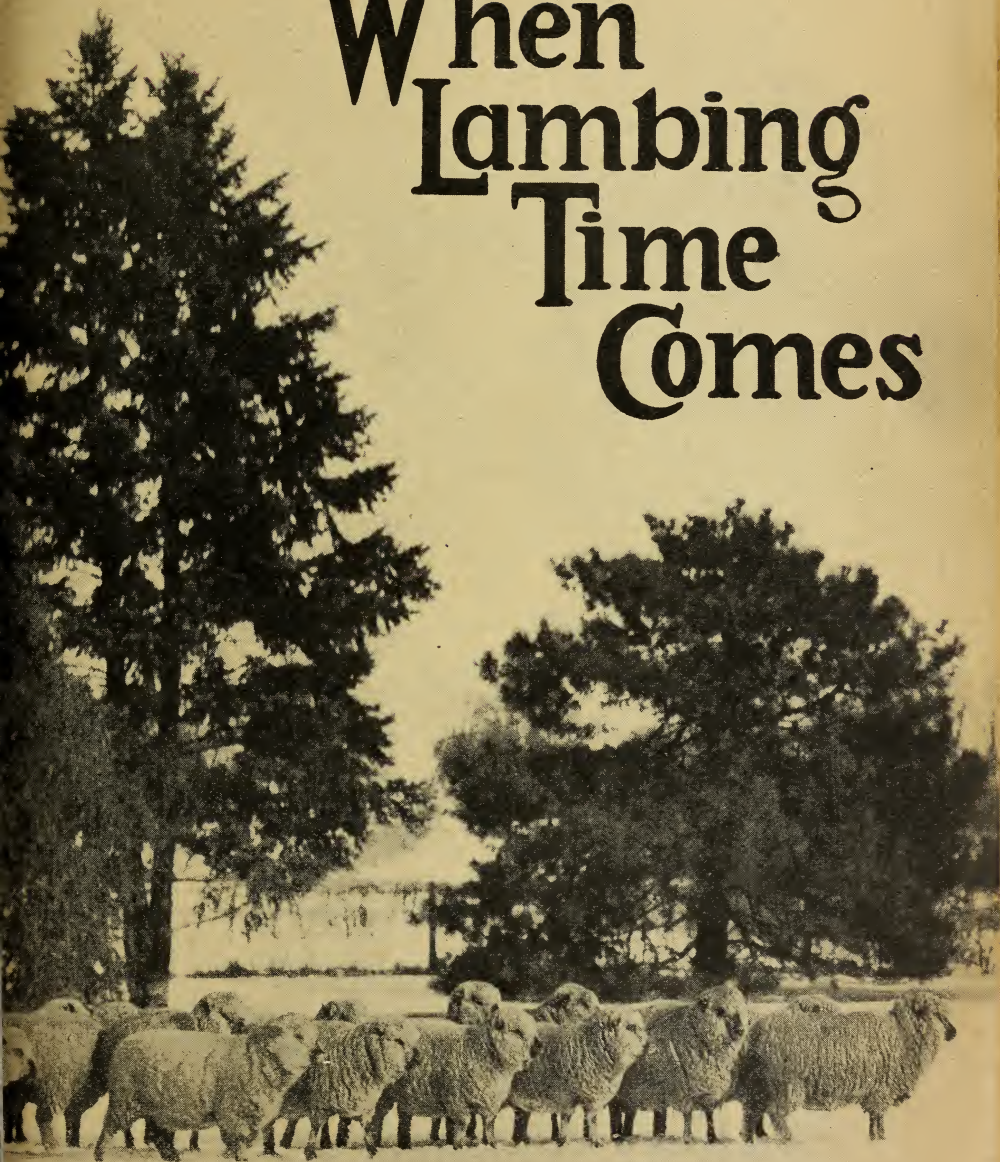
Total acreage of legumes alone..... 678,900 "

It is estimated that the average acre of inoculated legumes assimilates 50-100 pounds of atmospheric nitrogen each year. With an acreage of about 700,000 of legumes alone it is safe to conclude that at least 35,000,000 pounds of nitrogen and possibly more are gained by the growth of these crops. Thus this property of legumes, namely, to accumulate atmospheric nitrogen in such large quantities, gives them an enviable rôle in economic agriculture.



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When Lambing Time Comes



EXTENSION SERVICE OF THE COLLEGE OF AGRICULTURE
THE UNIVERSITY OF WISCONSIN
MADISON

LAMBING TIME SUGGESTIONS

Exercise pregnant ewes as much as possible. Keep them well sheltered in wet and stormy weather.

Do not feed timothy or marsh hay. Clover or alfalfa is best; feed all that the flock will eat without waste. Feed corn silage or roots—2 to 2½ pounds a head daily—to supply succulence.

Do not feed moldy or frozen silage or spoiled roots to sheep. Such feed is the cause of many ailments and will often kill the sheep.

Feed some grain at least a month before lambing; ½ pound a head daily of a mixture of equal parts of oats and bran is very helpful.

Give close attention to the ewes at lambing time. It will save many lambs, and occasionally a mother which would die if no help were given.

Pen the ewe and her new-born lambs away from the flock for a few days to prevent her disowning them. Increase the succulent feed and the grain for ewes the third day after lambing.

Castrate ram lambs on a bright day when they are one to two weeks old. Dock all lambs about a week later. Docking pincers are recommended.

Wean the lambs at 4½ to 5 months of age; do not let them wean themselves. Retain all the best ewe lambs for the future flock.

When Lambing Time Comes

FRANK KLEINHEINZ.



LAMBING time is perhaps the most important season of the year for the shepherd. A successful lambing period helps to make a successful sheep year. It then behooves every shepherd to have as high a percentage of strong, healthy lambs as possible. The lambs and perhaps here and there an ewe that he will save by the sacrifice of some sleep during

lambing will amply repay him.

Ewe Needs Good Care.

It is hoped that the ewes were flushed in the fall, entering their period of pregnancy in a vigorous condition and that they have had all the exercise that was possible during the winter. If they have had good hay such as clover or alfalfa and some succulent feed, no grain has been needed. The feeding of timothy hay is by all means to be avoided since this kind of hay has killed thousands of sheep from impaction of the bowels and constipation.

If the ewes are to lamb before going on pasture they should receive some grain about one month before lambing. This insures a good milk flow. Oats and wheat bran, either half and half or two parts of oats and one of bran, should be fed. One-half pound a day of this mixture for each ewe should prove sufficient.

It is also very important that succulent feeds, such as corn silage or roots, be given pregnant ewes. These keep the bowels in good condition and serve as general tonics and regulators. Many experienced shepherds also believe that the weight of the wool can be increased by feeding good succulence. All winter long each ewe should receive daily from

two to two and one-half pounds of it. After lambing this amount can be increased. It should be remembered that no frozen silage or roots should be fed to sheep. Either is very dangerous. The flock should be supplied with pure fresh water at all times and barrel salt should be placed within their reach so that they can get it at will.

The shed or barn in which the flock finds shelter need not be an expensive one. But it should have a good roof to keep the sheep dry from above and good bedding to keep them dry underfoot. The barn or shed should be kept free from draughts. It should be well lighted and have good ventilation. A basement barn is not well suited for sheep.

Exercise is It is of the greatest importance to give the
Essential. pregnant ewes all of the exercise possible whenever the weather permits. This insures a stronger crop of lambs and makes it easier for the ewes to deliver their lambs. This exercise can easily be given the ewes by spreading hay for them out in a field. Should the snow be deep a path may be made by using a device made by fastening two planks together in a V-shape drawn by a horse. The driver stands on the planks. It is easy to make a path through the snow in this manner for the sheep to travel in. However, during rainy days or snowstorms the flock should not be turned out. Their fleece would become wet, causing coughs and colds, possibly turning into pneumonia.

The average gestation period of breeding ewes is 146 to 147 days. The experienced sheepman provides himself with some movable hurdles 4x4 or 4x5 feet for possible use with ewes lambing. These are put up beside the barn to make lambing pens. In these are quartered the lambing ewes to avoid the common trouble—ewes disowning lambs. After a few days these ewes are taken out and others put in. Occasionally some ewes have their udders so covered or matted in wool that the lamb cannot find the teat. In such a case the wool should be clipped from the udder. Or perhaps the wax in the end of the teat must be squeezed out to enable the lamb to get the milk.



FIG. 1—A CHEVIOT EWE AND HER TWO PETS.
This pure-bred ewe's two lambs are four days old.

A lamb which may have had a hard time
Extra "Pains" in birth and looks almost lifeless often can
Increases Profit be revived by cleaning out the phlegm in
its mouth with the fingers, then blowing
into its mouth several times, and finally placing it on the
floor belly down and beating with two hands on each side
in the heart girth. If lung action does not start, repeat blowing
in the mouth and beating with the hands. If any life
is left, lung action may be started and the lamb may be
saved.

A chilled lamb may be revived by placing it in a pail of warm water clear up to its head. The water should be as warm as the hand can stand. Leave lamb in the bath for about five minutes, then rub it dry with a piece of woolen cloth and keep near a warm stove until it has fully recovered. Some milk should be milked from its mother and fed with a spoon to give it strength. After the lamb regains its strength it should be placed again with its mother. If the lamb should show signs of constipation, one or two teaspoonfuls of castor oil may be given it.

If a lamb should die the mother may become a stepmother. The dead lamb should be skinned and its pelt tied over another lamb from an ewe which perhaps has two lambs, and given to the stepmother to raise. In this way an ewe can be induced very easily to own another lamb which is not her own. The skin, however, should not be left on this adopted lamb longer than 48 hours. Another way, slower however, is to hold the ewe several times a day and night for about four or five days to let the lamb suck on her. After the milk has been circulated through the body of the lamb the ewe will also own it.

It is a good plan to examine all newly lambed ewes twice daily for a few days to make sure that all the milk has been taken out by the lamb or lambs, so that the udder does not become spoiled. If there should be a surplus it should be milked out.

Ewes which are heavy milkers might not be given any grain for three days after lambing in order to avoid milk fever. After this period they may be slowly started on grain again. It is well to tag the ewes at this time to prevent the young lambs from biting off and swallowing locks of wool which likely would lodge in their small intestines and cause death.

In grade flocks all male lambs should be **Castrate and** castrated. Grade rams should never be used **Dock Early.** for breeding. Castration should never be ~~the lamb~~ overlooked because it increases the market value of ~~the lamb~~ to a great extent. This operation, which is so often neglected by flock-owners, is not at all dangerous if properly handled.

If one is unfamiliar with this work he might call on someone who knows how and learn from him how to do it. To operate successfully one must exercise care. The proper age to castrate the lamb is from seven to fourteen days after birth.

A week later all lambs should be docked which further increases their market value and keeps them neater looking and prevents the infestation of maggots. Proper docking of females saves the vitality of the ram when it comes to breeding and insures all the ewes to become with lamb.

In case lambs are intended to be sold on an early market some extra feed should be provided them by means of a lamb creep. Here the youngsters can be fed some extra grain and hay away from their mothers. The grain may consist of two parts of wheat bran, one part of oats, one part of finely ground cornmeal and one-half part of oilmeal. The hay may be either clover or alfalfa. This in addition to their mother's milk makes them gain most wonderfully. They generally start to eat when about two weeks of age.

Parasites The good flockmaster recognizes the necessity of keeping his flock clean from lice and ticks. Therefore he makes it a point to **Cut Profits.** dip his sheep each year. Perhaps the best time for dipping is about two weeks after shearing. He selects a nice warm, bright morning and dips them in one of the recognized standard dips. The reason that this should be done in the morning is that the sheep may have a chance to dry off before night comes.

Many flock-owners realize that generally the weather becomes dry in the summer and the pastures get short. Therefore some sow a patch of rape on which they can turn their flock for feed at this period. Others sow some rape with the last cultivation of corn which furnishes a great deal of feed for fall feeding.

Have Fixed Many a sheep-owner makes the mistake of not weaning the lambs. It is very poor **Weaning Time.** policy not to wean them. When the lamb has had the benefit of its mother's milk for about four and one-half to five months it should always be weaned. The only exception is in the case of early lambs

which are marketed in June or July, while still suckling their dams.

This gives its mother an opportunity to restore vigor, flesh and vitality for the next breeding season. This is necessary. The lamb is better off if it is weaned and put on fresh pasture which reduces the infection of parasites. The ewes should be milked out as often as necessary until they are dried up, in order to save their udders from spoiling.

If the flock-owner should find that the clover has been winter-killed it would be well for him to sow peas and oats together in the spring. Use two parts of peas to one of oats and let that grow together until nearly ripe, then cut the crop and cure it into hay which will take the place of clover hay the following winter.

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JUL 5 1922
April, 1922

Fifty Years of Dairy Progress

MARKETING

and Plans for Fifty More

EXTENSION SERVICE OF THE
COLLEGE OF AGRICULTURE
THE UNIVERSITY OF WISCONSIN
MADISON

FOREWORD

Just fifty years ago today (February 15, 1872) seven men met at Watertown and organized the Wisconsin Dairymen's Association which has been maintained since as a vital force in the improvement of the state's greatest industry. Commemorative of the half century of unbroken progress of Wisconsin dairying, the state legislature authorized an appropriation for the purpose of making a fitting exhibit at the National Dairy Show in St. Paul in October, 1921. This exhibit was again displayed in the stock pavilion at the University of Wisconsin during "Farmers' Week." On the latter occasion a statue was unveiled to the memory of the late Governor Hoard, one of the leading spirits in the work of the Wisconsin Dairymen's Association.

Around the "Hoard Memorial" and the "Fifty Years of Dairy Progress" was centered the Farmers' Week program. The slogan for this occasion was, "Fifty Years of Dairy Progress—Let's Plan for Fifty More."

The purpose of this circular is to portray briefly the accomplishments of the past fifty years as summarized in the exhibit and to outline plans for the future development of dairy marketing organizations as recommended by committees representing the various branches of the dairy industry.

K. L. Hatch.

FIFTY YEARS AGO

**IN THE DAYS OF THE BRINDLE COW,
THE DASH CHURN, THE BUTTER BOWL
AND THE GROCERY STORE MARKET,
COMMERCIAL DAIRYING IN WISCONSIN
WAS OF LITTLE IMPORTANCE.
THE ENTIRE DAIRY OUTPUT OF THE STATE
WAS WORTH LESS THAN A MILLION.**

**THE INDUSTRY NEEDED
ORGANIZATION AND LEADERSHIP
AND THE APPLICATION OF SCIENCE
AND SOUND BUSINESS
MANAGEMENT FOR ITS
PROPER DEVELOPMENT.**



The Dairy Pioneer

Half a century ago Wisconsin dairying was very primitive indeed. We then had no recognized dairy breeds, no adequate housing, no dairy equipment, *all* deemed so essential to the dairy business of today. Crude log-houses, straw sheds, and pole fences were very common. Nowhere was there evidence of bred-for-production dairy cattle suited to winter dairying. The farmer who was in the dairy business in 1871 was indeed

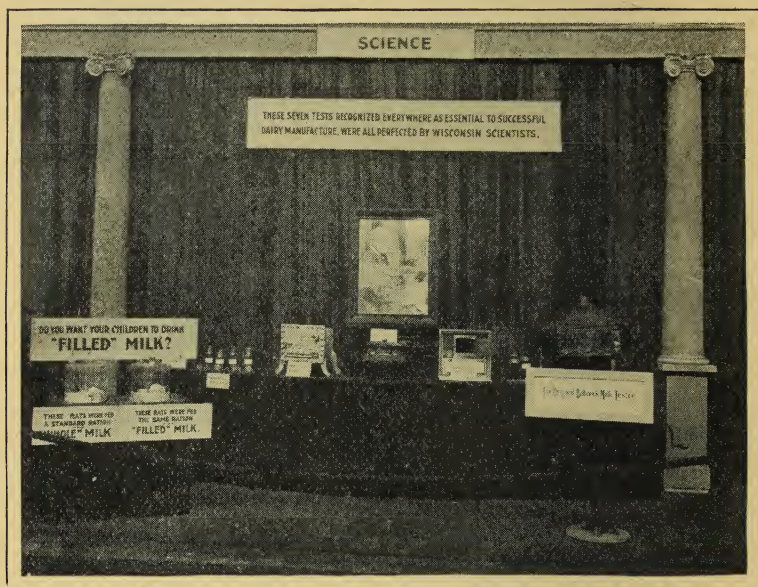
A PIONEER



“In Union Is Strength”

Wisconsin farmers recognized very early the need of organization and leadership for the development of the dairy industry. Fostered by the parent association, co-operative creameries and cheese factories sprang up all over the state. Other organizations for the promotion of better breeding, more economical production and more efficient marketing followed in their wake. The success of these were almost wholly dependent upon

COMPETENT LEADERSHIP



Science and Dairying

Science has been the corner stone of dairy progress. Wisconsin scientists, besides contributing all the tests so essential in modern dairy manufacture, have also shown that "milk is the one protective food in the human dietary." The protection of the industry, itself, from the destructive force of cheaper "substitutes" may finally rest upon the fact that

MILK IS A PERFECT FOOD



The Inventors' Contributions

Everywhere science and invention are closely knit together, but nowhere is this more easily apparent than in the dairy industry. The centrifugal separator is a close ally of the Babcock test; the sanitary pail goes hand in hand with the sediment test; and the milk record sheet, the weighing scales and the milking machine are all boon companions. In dairying,

SCIENCE AND ART GO HAND IN HAND



A Flood of Milk

How much is ten billion pounds of milk, Wisconsin's yearly output? Think of it! Think of it flowing over Niagara Falls, harnessed to machinery, turning the wheels of industry, lighting our homes, and moving the traffic on our streets! Yet this is exactly what it does. It is the life blood of our Commonwealth. It furnishes to the people of Wisconsin more than

ONE QUARTER OF THEIR TOTAL INCOME



The Modern Dairy Barn

Warm, light, sanitary barns, provided with an abundance of fresh air and equipped with humane stanchions and drinking cups, dot the Wisconsin landscape. Pastures are filled with a uniform type and color of dairy cattle which indicates the farmer's preference for some well-known dairy breed. With a roomy silo, a house to match, and a high bred herd, such a farm is easily recognized as

AN UP-TO-DATE DAIRY FARM

TO-DAY

WISCONSIN IS THE PREMIER DAIRY STATE. SHE HAS A GRAND TOTAL OF 3,000,000 DAIRY CATTLE WHICH INCLUDES-

80,000 PURE BRED HOLSTEINS

20,000 PURE BRED GUERNSEYS

8,000 PURE BRED JERSEYS .

WISCONSIN HAS MORE OF EACH ONE OF THESE BREEDS THAN CAN BE FOUND IN THEIR ORIGINAL HOMES & IN ADDITION:

2,000 PURE BRED BROWN SWISS

1,700 PURE BRED AYRSHIRES.

THE STATE NOW HAS - 90,000 SILOS 3,000 CHEESE FACTORIES. 800 CREAMERIES 70 CONDENSERIES & HER ANNUAL DAIRY OUTPUT IS VALUED AT \$300,000,000

WISCONSIN IS THE HOME OF THE LARGEST CO-OPERATIVE CHEESE MARKETING COMPANY IN THE UNITED STATES THE WISCONSIN CHEESE PRODUCERS FEDERATION, WHICH WILL HANDLE THIS YEAR 7% OF THE NATIONS ENTIRE CHEESE PRODUCTION THE NEW STATE DEPT. OF MARKETS HAS RECENTLY ESTABLISHED A CHEESE GRADING SYSTEM UNDER WHICH QUALITY AND PRICE WILL BE CLOSELY ASSOCIATED.

WISCONSIN DAIRYMEN ARE RAPIDLY DEVELOPING CO-OPERATIVE AGENCIES FOR HANDLING, STORING AND MARKETING DAIRY PRODUCTS.

THERE IS NOT A FARMER, NOT A MANUFACTURER, NOT A BANKER OR ANY OTHER BUSINESS MAN IN THE STATE OF WISCONSIN WHO DOES NOT OWE A DEBT OF GRATITUDE TO THE DAIRY COW.

Organize for Dairy Marketing

THEODORE MACKLIN

FOR A HALF CENTURY farmers who believe in cooperative marketing have had before them the problem of the "fork in the road." Which of two roads to choose has been the puzzle of cooperative marketing organizations as well as the cause of many of their most disastrous failures. With one road labeled "Profits From Monopoly Control of Prices" and the other "Profits From Efficiency in Competition," the farmers, instead of uniting efforts to win success, have broken ranks to prove time and again that "a house divided against itself shall not stand." Progress in cooperative marketing in the dairy industry of Wisconsin for the fifty years to come depends upon the farmers' decision to choose the correct fork in the road and to strive unitedly to win the rewards of such action. Which is the correct road? What rewards lie ahead? These are questions that every dairyman who expects to participate in the marketing of his own products must answer.

SATISFIED CONSUMERS MAKE MARKET

Farmers work to produce because consumers' needs must be met. Consumers must be willing to pay enough to cover the costs of production and marketing of the amount of goods which they want. That they buy what they please, as their purchasing power permits, is a fact which no one can deny. But they cannot be expected to buy just because someone has gone ahead and created a product. On the contrary, consumers bid a price high enough to get whatever goods they need and their means permit. Successful marketing recognizes these consumer characteristics and instead of trying to force payment of monopoly prices, induces consumers to buy by offering a quality product in a pleasing and inviting manner. It is through efficient merchandising and advertising that most of the recent successful private marketing enterprises have made their profits, not through monopoly.

FARMERS' MONOPOLY AIM SELF-DESTRUCTIVE

To those who are blinded by the glamor of monopoly power as a road to large profits, recent experience lifts a warning hand. The most highly monopolized products yield only losses when the consumers' demand is withdrawn. But more important to farmers, than the fact that monopoly cannot force prices from unwilling buyers, is the inevitable consequence that high prices temporarily secured from monopoly control are certain to stimulate increased production, which automatically reduces the price and breaks up the organization.

Farmers who join an organization for the single purpose of securing and maintaining artificially high prices through any kind of manipulation are destined to meet falling prices brought about by increased production. As a consequence of falling prices, members cease to be loyal and imminent failure forces either reorganization or dissolution of the enterprise. This has been the experience of numerous farmers' cooperative marketing associations. Today all of the successful cooperative marketing companies that have been operating over a period of five years or more have wholly abandoned the hope of gain by manipulation of the raw material or exercising other monopoly powers. They have learned that success comes through efficiency in rendering satisfactory marketing service to satisfied buyers and consumers.

UNDERMERCHANDIZING, NOT OVERSUPPLY, THE TROUBLE

Many marketing organizations have chosen the wrong fork in the road—the one labeled "Profits From Monopoly Control"—because they have thought overproduction was the cause of unsatisfactory prices. That demand is more important than supply has not occurred to them. If there is any truth in the idea that overproduction resulting in oversupply, is the cause of unsatisfactory prices, there is a greater merit in the idea that underdemand is the real cause of poor prices. The "so-called" oversupply exists as the result of work already done and cannot be remedied, while underdemand is a present condition that readily may be overcome by efficient marketing, utilizing proper advertising and merchandising methods.

Farm products, because of seasonal conditions over which the producer has little control, may be harvested in either large or

small quantity, irrespective of acreage. The harvest cannot be forecast at planting time. This makes controlled production impossible. Efficient marketing, however, with the correct use of advertising and selling methods, is able to stimulate a demand sufficient to absorb an increased output after the supply is in sight. It is this ability to make demand grow to fit variable supply, contrasted with futility of efforts to limit or to manipulate production, that tells which road to take. The outstanding success of the American Cranberry Exchange is due to its work of stimulating demand to absorb the so-called "surplus" and in feeding the market. Its success has not been due to efforts to limit output or to manipulate production. The same is true of all the great cooperative marketing associations of California and elsewhere that have weathered the storms of a decade of business experience.

SUCCESS IN COMMODITY MARKETING ORGANIZATIONS

Merchandising deals with the finished commodity which is what the final consumer wants. Those organizations which choose the road labeled "Profits From Efficiency in Competition," seek to produce those goods which guarantee them the largest possible number of satisfied consumers as regular customers.

The commodity is defined, by these successful organizations, as the finished product, instead of the raw material. Their primary purpose is to place on each and every market all the goods that can be absorbed and no more, after having stimulated a demand sufficient to exhaust the entire annual output of the industry. Those organizations of farmers built up for the purpose of employing talent capable of selling the maximum quantity of farm products to the best advantage have become widely known as "commodity marketing organizations."

THE FORM OF COMMODITY MARKETING ORGANIZATIONS

The form of organization most successfully used throughout the world, whether in Denmark, Siberia, the United States, or New Zealand, is built upon the foundation of: first, a group of well-informed cooperating farmers, united locally in a substantial and formally organized single community association for each type of commodity. Second, the union of a number of these local community enterprises into a central organization. Such

an organization, because of the aggregate volume of product, provides sufficient business to justify the expense of employing the highest grade talent and rendering needed services which no single local association alone can undertake.

Where the commodity is widely produced and great numbers of farmers are destined to become members, a third step in organization is important. This requires the union of a suitable number of local associations into a district association, these district associations in turn uniting to provide the central sales organization. The fourth and final stage of organization, a step which cannot be undertaken until there are a number of firmly established commodity marketing enterprises, is to unite the separate central commodity organizations for the purpose of providing further services which no single commodity enterprise alone can undertake. One example of a service which this fourth stage of organization can render is the operation of car routes to supply small towns with assembled variety of products delivered at carlot rates instead of each singly at less-than-carlot rates.

"FIFTY YEARS OF DAIRY PROGRESS" JUBILEE OUTLINES MARKET PLANS

Realizing that future progress in dairying depends primarily upon improvement in the marketing of their products, dairy leaders for a number of years have been working toward this end. The first united effort was made by the "Get Together" Market Conference in February, 1921—the results of which are outlined in Extension Circular No. 136 of the Wisconsin College of Agriculture.

Continuing this work, representative committees of persons engaged in the production, manufacture and distribution of the various dairy products reported the results of their findings to farmers and others who had come together at Madison to celebrate "Fifty Years of Dairy Progress and Plan for Fifty More" during the week of January 30 to February 4, 1922.

FUNDAMENTAL POLICIES IN ORGANIZATION WORK

These committees all agreed on the following fundamental policies which should govern the organization of cooperative marketing associations.

1. That any state-wide plan for a dairy marketing organization should be so arranged that already existing local organizations may join in a body if they so desire, providing they conform to the general plan outlined for the state organization.

2. That marketing organizations should not seek to establish a *monopoly* price. That milk prices, therefore, must necessarily be adjusted on the basis of adequate supply and demand information with reference to milk and its competing commodities.

3. That promises of increased returns to farmers who join dairy marketing organizations must be made on the basis of economies in marketing, price stabilization, expansion of markets and production of high quality goods that are capable of commanding better prices.

4. That organization should progress from community to community in order to concentrate membership around already established local markets or concentration points. This is in the interest of economy of both time and money used in securing members.

5. That any state-wide cooperative dairy marketing organization must be independent of all organizations other than dairy marketing, and must stand or fall on its own merits in competition with already existing marketing agencies.

6. That, above all else, such cooperative dairy marketing agencies must provide for proper financing, and give a reasonable assurance of efficient management.

In harmony with these general policies the conference adopted reports of the respective committees on American cheese, foreign cheese, butter and market milk, vigorously recommending the establishment of farmers' cooperative commodity marketing federations for each of these finished products. The recommendations adopted for each product follow.

RECOMMENDATIONS OF MARKETING COMMITTEES

REPORT OF MILK MARKETING COMMITTEE

We recommend:

1. That milk producers normally furnishing the same local or community markets be organized to obtain facts concerning milk production, improvement of quality, conditions of manufacturing or distributing and such other economic understanding as will impress all parties with their mutual problems and responsibilities.
2. That each local milk producers' association maintain a relations committee to meet with a similar committee appointed by the agency to whom milk is sold, for the purpose of providing at all times a sympathetic point of contact and a direct means of approaching and considering each other's problems.
3. That the above committee should work in part, at least, with the committee of the marketing agency to whom milk is sold to study the relative merits of the various existing or prospective market outlets, and to foster the establishment of co-operative enterprises for the manufacture of dairy products whenever and wherever conditions warrant or demand such action, keeping in mind the education of all concerned upon the following:
 - A. Lowering the cost of manufacturing and distributing milk or its products.
 - B. Lowering the cost of producing whole milk.
 - C. Improving the quality of raw milk and its finished products.
 - D. Fundamental principles of economics as applied to production and to marketing.
4. (a) That the members of all branches of the dairy industry should unite with the consumers in a campaign of education for the use of milk and an appreciation of its value to the end that parents may be led to realize that milk is an inexpensive food which should not be eliminated from the diet of the growing child. Such a campaign should result in a better understanding by consumers in both city and country that milk and other dairy products are absolutely indispensable in the daily diet if we are to continue

as a nation of healthy and vigorous men, women and children.

- (b) That consumers should be stimulated to aid in providing adequate local distribution which will make available a sufficient supply of wholesome milk.
5. That a committee of seven members consisting of one authorized representative from each of the following organizations:
- American Society of Equity
 - Wisconsin Cheese Producers' Federation
 - Wisconsin Farm Bureau
 - Wisconsin Dairymen's Association
 - Milwaukee Milk Producers' Association
 - College of Agriculture
 - Department of Markets

meet subject to call by the Department of Markets to work out a definite program for the cooperative marketing of the different dairy products of the state, to which all these and similar organizations may subscribe.

Signed:

Paul C. Burchard, Rep. Wis. Dairymen's Assn., Ft. Atkinson.
K. L. Hatch, Rep. College of Agriculture, Extension Service, Madison.

G. R. Rice, Rep. Milwaukee Milk Producers' Assn., Milwaukee.
John LeFeber (per F. W. Kelly), Rep. Gridley Dairy Co., Milwaukee.

Theodore Macklin, Rep. College of Agriculture, Agricultural Economics Department, Madison.

Geo. McKerrow, Rep. Wisconsin Farm Bureau Federation, Madison.

Edw. Nordman, Rep. Wisconsin Department of Markets, Madison.

E. C. Pommerening, Rep. Wisconsin State Union, A. S. of E., Madison.

Mrs. H. S. Richards, Rep. Wisconsin Federation of Women's Clubs, Madison.

Mrs. Mary P. Morgan, Rep. State Board of Health, Madison.

Mrs. Frank F. Howe, Rep. Milwaukee Fair Price League, Milwaukee.

A. E. Hansen, Rep. Libby, McNeill & Libby, Whitewater.

C. P. Norgord, Rep. State Department of Agriculture, Madison.

REPORT OF AMERICAN CHEESE MARKETING COMMITTEE

Your committee finds:

That the Wisconsin American Cheese Industry is suffering principally from three things:

1. Unfair competition among local factories and among the various middlemen which accentuates the making of low-grade, high moisture cheese to the detriment of the entire industry by delivering to the retailer a product for which consumers will not pay remunerative prices.
2. The fact that farmers have never united ideas and action upon the basis of fundamental conditions and principles underlying the cheese industry and its marketing problems.
3. The fact that farmers have not heretofore sufficiently understood the most practical form of organization to apply to the cheese industry as a means of improving their market and the marketing of their product.

In the light of these conditions your committee recommends:

1. That the Wisconsin Department of Markets and the Wisconsin Dairy and Food Commission vigorously enforce the law respecting grading, moisture in cheese, and all cases of unfair competition.
2. That the form of organization best adapted to the cheese industry is the same as that which has been so successfully developed by the California Fruit Growers Exchange. This emphasizes the establishment of: first, powerful local organizations, the cheese factories; second, district associations of cheese factories, with properly located, paraffining stations and cold storages; third, the central sales organization, the Wisconsin Cheese Producers' Federation.

For any form of organization to succeed requires efficient management and volume of business. Each of these depends on the other. Hence if the marketing of Wisconsin American Cheese is to be improved it must be done by enlarging the Wisconsin Cheese Producers' Federation to have a membership of a large proportion of the state's cheese factories and thereby to market the bulk of Wisconsin Cheese as elaborated in Wis. Agr. Expt. Sta. Buls. 322 and 346, and Circular 136.

3. Recognizing that marketing is a very important part of every general farm organization, farmers' organizations, whether

local or state-wide, should at once take upon themselves as a part of their program definite activities to promote the expansion of the Wisconsin Cheese Producers' Federation.

Signed:

Math. Michels, Rep. Department of Markets, Madison.

R. R. Runke, Rep. Wisconsin Farm Bureau Federation, Fond du Lac.

Walter C. Brill, Rep. Wisconsin Cheese Producers' Federation, Oostburg.

Theodore Macklin, Rep. College of Agriculture, Agricultural Economics Department, Madison.

F. G. Swoboda, Rep. Wisconsin Cheese Producers' Federation, Plymouth.

*Ben Lang, Rep. Wisconsin State Union, A. S. of E., Marshfield. (For footnote see p. 23).

REPORT OF FOREIGN CHEESE MARKETING COMMITTEE

Moved and seconded that the plan in general as outlined by the temporary Board of Directors of the United Foreign Cheese Producers be adopted as the proper plan for marketing foreign types of cheese, and that this plan should be presented to the conference assembled for approval and is hereby made a part of this report.

Signed:

K. S. Smith, Rep. Foreign Cheese Producers' Federation, Fond du Lac.

R. J. Paulson, Rep. Foreign Cheese Producers' Federation, Riley.

Harvey B. Fargo, Rep. Wisconsin State Union, A. S. of E., Mt. Horeb.

L. G. Foster, Rep. Wisconsin Department of Markets, Madison.

C. P. Norgord, Rep. Wisconsin Department of Agriculture, Madison.

BY-LAWS OF THE UNITED FOREIGN CHEESE PRODUCERS (A COOPERATIVE ASSOCIATION)

Article I.

The provisions of the Articles of Incorporation of this association are hereby made a part of these by-laws.

Article II.

The regular annual meeting of the members shall be held on the third Thursday of February of each year. The president of this association may call special meetings of the association in the manner provided by law.

The president of this association shall call a district meeting in each of the following counties: Dane, Dodge, Fond du Lac, Green, Iowa, Columbia, Lafayette, not more than thirty days nor less than ten days prior to any annual or special meeting of this association. At each district meeting the members located in each county may elect one delegate for each ten members or for any lesser number and one delegate for the remaining fraction of the whole number of members. Each delegate at the association's meeting (or his appointee in his absence) shall be entitled to cast one vote for every member represented by him; provided, that no delegate shall represent more than ten per cent of the members of the association.

Article III.

The directors shall be elected annually at the regular annual meeting of the members and shall hold their offices for one year. Every one of the counties named in Article II of these by-laws shall be represented by one director. Such director shall be nominated by the vote of the district meeting provided for in Article II of these by-laws. No person shall be director unless he is or has been a milk producer and a member of a co-operative cheese producers' association.

The regular annual meeting of the board of directors shall be held within ten days after the regular annual meeting of the members. The board of directors shall meet the last Monday of each month thereafter. The secretary of the board shall call special meetings thereof upon order of the president of the board or any three directors, but notice of any special meeting shall be given to all directors not joining in the call therefor. Every meeting of the board of directors shall be open to the Commission of Markets and notice of every such meeting shall be given by the board of directors to said Commissioner of Markets.

The directors, at their regular annual meeting, shall elect from their number a president, vice-president, secretary and treasurer. The directors shall employ such salesmen, inspectors and other employes as may be necessary and shall fix the compensation of all officers and employes.

The directors shall require any officer or employee to whom funds of the association are intrusted to furnish bond, and the expense of such

bond shall be paid by the association.

A majority of the board of directors shall constitute a quorum for the transaction of business, but a less number may adjourn from day to day upon giving notice to absent members of said board of such adjournment. Any vacancies occurring in the board of directors shall be filled by the remaining members thereof.

The directors shall have authority to remove any officer for cause, or any employee at any time, and fill any vacancy caused by such removal.

The directors shall be entitled to five dollars per day and railroad fare for attendance at directors' meetings.

Article IV.

Each member of this association shall furnish to this association any information which the board of directors thereof may require concerning the production or distribution of cheese or by-products by or for such member.

Article V.

These by-laws may be amended by a majority vote of the members at any regular or special meeting, except where otherwise provided by law.

REPORT OF THE BUTTER MARKETING COMMITTEE

The data collected by correspondence and by conferences with managers of cooperative creameries in the state have convinced the committee that a friendly and business-like cooperation of a group of factories in a given territory will be much more profitable to the farmers supplying the milk and cream to these factories than can be obtained by competition.

The committee has found that creameries making butter of approximately the same quality do not all receive the same price for it. These differences in prices may be due to a number of things:

First, to selling in markets where the difference in freight rates is less than the difference in butter quotations.

Second, there is considerable difference in the methods of weighing butter, both by the creameries and by the butter buyers in different markets.

Third, the margin which the buyer of butter demands for his services is quite different in the different markets.

Fourth, the price received for the butter sold by a creamery is greatly influenced by the number of times the butter is sold before it reaches the consumer, therefore the nearer the creamery butter is to the consumer, the higher the price the consumer can pay the creamery for its butter.

In view of the fact that the managers of many of our creameries have neither the time nor the training necessary for marketing butter at the highest prices available at a given time, and further, since it is evident that an improvement can be made in the present methods of making and marketing our creamery butter,

YOUR COMMITTEE RECOMMENDS: The organization of a Butter Marketing Federation patterned after the model of the Wisconsin Cheese Producers' Federation, and begs leave to submit the following suggestions to co-operative creameries:

1. That a general meeting of all parties interested in the welfare of a number of creameries in a given territory be called at some appointed time.
2. A meeting of this kind should be well advertised and talked about for some time before the appointed date.
3. The managers, directors, and patrons of the creameries interested in such a movement should be informed at this meeting of the prices received for butter and the prices paid for equipment and supplies by the different creameries.
4. An explanation should be made of the possibility of reducing the cost of gathering milk and cream when one wagon only covers a given territory.
5. Attention should be called to the importance of pasteurization of cream at the creamery and of cream cooling tanks at the farms.
6. A report may be made on the saving in freight when butter is sold in carload lots, as compared with shipments of less than this amount.
7. After a discussion of the points mentioned and any others that may come up at this general meeting, an organization committee should be appointed for the purpose of collecting information that will be helpful in determining the best course to pursue in order to accomplish the desired results.
8. At a later meeting, this organization committee should report on the advisability of employing a fieldman who is competent to direct the standardization of the methods of buttermaking at the different creameries, and to advise farmers in regard to the care of milk and cream on the farms.

9. The committee will determine the basis on which the necessary funds for employing a fieldman shall be raised.
10. The committee shall make a detailed report of its recommendations and suggest ways and means of carrying out the plans suggested, at a later meeting of all parties interested in such a creamery league.
11. Any creamery in the state may have its butter regularly inspected by a state official who has been specially trained for this work.
12. Each shipment of butter from a creamery shall be stamped or branded by this official either at some grading station to which the butter is regularly shipped or at the creamery.
13. The specifications for the different grades of Wisconsin butter shall be supplied by a committee selected for this purpose.
14. Each official butter grader must secure a license which will be issued after passing a satisfactory examination.

Signed:

E. H. Farrington, Rep. College of Agriculture, Dairy Department, Madison.

H. C. Larson, Rep. Wisconsin Buttermakers' Association, Madison.

Mrs. L. Mattson, Rep. Department of Markets, Amery.

Hon. Geo. Nelson, Rep. Wisconsin State Union, A. S. of E., Milltown.

Herman Ihde, Rep. the State Grange, Neenah.

K. L. Hatch, Rep. College of Agriculture, Extension Service, Madison.

*James Clemens, Rep. Wisconsin State Union, A. S. of E., Kansasville.

*NOTE.—Messrs. Lang and Clemens were designated to represent the American Society of Equity on the cheese and butter marketing committees. Neither of these men were present at a regular committee meeting and hence did not sign the report. Each was furnished with a copy but to date of going to press no word of approval or dissent had been received.



**WISCONSIN'S PRODUCTION OF MILK
IS : 10 TONS FOR EVERY MINUTE OF THE
DAY AND NIGHT THROUGHOUT THE YEAR.
ONE TENTH OF THE NATIONS TOTAL
MILK SUPPLY !**

**EVERY POUND OF THIS HEALTH AND
STRENGTH GIVING FLUID IS A
SYMBOL OF GOOD ROADS, GOOD
SCHOOLS AND HAPPY HOMES
EVERYWHERE .**

"ON WISCONSIN"

Published and distributed under Act of Congress, May 8, 1914,
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the United States Department of Agriculture cooperating.

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REGISTER OF PRODUCTION COWS



EXTENSION SERVICE OF THE COLLEGE OF AGRICULTURE
THE UNIVERSITY OF WISCONSIN
IN COOPERATION WITH
THE WISCONSIN DAIRYMEN'S ASSOCIATION

WHY?

The Wisconsin Register of Production was established:

1. To secure better breeding, better feeding methods, and better care for Wisconsin dairy cows.
2. To emphasize the necessity of judging a bull according to the work of his daughters.
3. To increase the purchase and sale of cows on the basis of yearly production, and of calves and bulls.
4. To establish recognized yearly records for pure bred and grade cows when these cows would otherwise be without records.

Register of Production Cows

A. J. CRAMER.

PRODUCTION RECORDS take much of the gamble out of dairying. For that reason the Wisconsin Register of Production—the only one of its kind in the United States—was established in 1918, by the Wisconsin Dairymen's Association and the Wisconsin College of Agriculture. It aims to do for the grade cow what Advanced Registry does for the purebred; that is, to raise the average yearly production of the Wisconsin dairy cow and the average yearly profits of the Wisconsin dairyman.

High standards can be reached by the dairyman if he tries. The Register of Production shows him something of how good cows come to be—how dairy qualities are inherited and how they are brought out by the good feeding and care. It is not practicable nor desirable that all herds be purebred, but no progress can be hoped for through the scrub sire. The grade cow will be our main dependence for dairy production for generations. But to get her we must have the purebred sire, and for both we need a means of measurement and a record which we have in the scales and Babcock test, the Advanced Register and the Register of Production.

During the first two years after the Register of Production was started, 421 cows of all breeds, registered, grade and native, were listed in the Register as compared with 779 cows the following year, which includes 37 re-entries. More than twice as many purebred cows, or 255, entered last year as compared with 116 during the first two years.

Table I.

NUMBER OF REGISTER OF PRODUCTION RECORD COWS ENTERED.

Breed	1918 to 1920	1921	Total to Date
Reg. Holstein	86	180	266
Gr. Holstein	170	271	439
Reg. Guernsey	22	46	68
Gr. Guernsey	82	162	244
Reg. Jersey	6	21	27
Gr. Jersey	24	43	67
Reg. Brown Swiss	0	7	7
Gr. Brown Swiss	0	7	8
Reg. Ayrshire	2	1	3
Gr. Ayrshire	0	2	2
Gr. Shorthorn	2	7	9
Red Polled	0	2	2
Native	27	29	56
	421	779	1,199

The 1920 summary for 46 associations, including yearly records on 19,680 cows gave an average yield of 6,141 pounds of milk and 248.4 pounds of butterfat. The 1921 summary for 57 associations on 28,215 yearly record cows produced an average of 6,938 pounds of milk containing 264.5 pounds of butterfat. During the period of two years the production was increased to the extent of 797 pounds more of milk and 16.1 pounds more of butterfat.

Table II.

AVERAGE PRODUCTION WISCONSIN COW TESTING ASSOCIATIONS.

	1920	1921	Gain
Associations (with annual reports)....	46	57	11
C. T. A. cows considered.....	19,680	28,215	8,535
Milk av. Wis. C. T. A. cow.....	6,141.0 lbs.	6,938.0 lbs.	797.0 lbs.
Fat av. Wis. C. T. A. cow.....	248.4 lbs.	264.5 lbs.	16.1 lbs.
Milk av. Wis. cow	4,750.0 lbs.	4,926.0 lbs.	176.0 lbs.
Fat av. Wis. cow	183.0 lbs.	190.0 lbs.	7.0 lbs.

The Register of Production is intended to give larger publicity to grade and registered cows making good records (1 pound of butterfat per day) in cow testing associations and to make these associations of greater financial benefit to their members. It has stimulated the dairyman to take better care of his cows and to feed them better, thus enabling him to register more animals.

At a dairy cattle sale the animals which have creditable cow testing association records are the ones for which the buyers clamor. When a dairyman buys cows for his future herd, he is willing to pay the additional \$25 or \$50 for known production. It is seldom that a Register of Production cow is advertised for sale, because such cows are usually sold at private sale or kept by the breeder for his future herd.

Usually cow testing association cows yielding under 200 pounds of butter fat are undesirable. These are the cows that create a surplus of milk on the market and help to bring down Wisconsin's average production to that of less than 5,000 pounds of milk and 190 pounds of butterfat. If all Wisconsin cow testing association cows still unable to produce at least 200 pounds of butterfat were sent to the block, our average cow testing association cow would yield over 300 pounds of butterfat per year. There should be at least 1,000 cow testing associations in Wisconsin, or still better, one association in every township in the state.

The Register of Production aims to be self-supporting. The cost will be the expense that may be incurred in providing the necessary blanks, in checking and recording the records, in issuing the certificates and in publishing and distribution of the year book which is issued. A fee of \$1.00 for each cow has been charged, which has not been sufficient to cover the expense of conducting the register. The greater the number of entries made the more funds will be available for giving publicity to the records.

Table III.

INCREASED ENROLLMENT OF REGISTER OF PRODUCTION COWS.

	1918-20	1921	Total to Date
R. O. P. cows registered.....	421	779	1,199
R. O. P. cows fed silage and grain	416	754	1,170
R. O. P. cows purebred	116	255	371
R. O. P. produced over 500 lbs. butterfat...	27	39	66

MARKETING FEED THROUGH THE DAIRY COW

Like the factory, the dairy cow transforms raw materials—silage, hay and concentrates—into a finished product, milk. In that way, she furnishes a market for our feeds. Whether that market be good or bad depends in part upon the way the cow is fed, and in part upon the cow.

There is no better way to market the feeds grown on the farm than to feed them to a high producing herd of dairy cows. It is much easier to send the butterfat to the creamery than to haul hay and grain to town. Instead of selling hay and grain that may go to enrich the soil in some far distant state, or in a foreign country, the wise dairy farmer markets such products through his dairy cow.

KEEPING RECORDS

The keeping of individual cow records is easy. To test a dozen samples of milk for butterfat requires about half an hour, and the weighing of milk and establishing of the weight of the roughage and the weighing of concentrates requires but little time.

Is cow testing worth while? The dairyman who recently joined a cow testing association, the dairyman who has seen the profits of his herd more than doubled through the work of the association, or the breeder of high class purebred dairy cows, will always answer "yes."

Cow testing is not worth while to the dairyman who makes no use of the records and who continues the doubtful practice of former years, but the dairyman who desires to feed and breed according to known production finds it worth while. The Register of Production records indicate how economically these cows were fed.

THE HIGH COW FOR 1921

Bessie of Oaklawn Farm, a grade Guernsey cow, owned by George Vandre of Dunn county, is the new association queen, and is also the highest record cow in the Register. Wisconsin cow testing associations must pay honor to this new champion cow, replacing the well known Holstein leader, Aaggie, owned by Huenink and Lubach of Sheboygan county. The new champion's record in Dunn county, No. 1 Cow Testing Association, is 15,440 pounds of milk and 726.2 pounds of butter fat, with an average test of 4.7 per cent.

The fact that this new leader is a Guernsey puts a bit of breed rivalry with the spirit of friendly competition existing in Wisconsin testing associations. How long will "Bessie" hold this honor?

THE RULES OF THE R. O. P.

1. The Wisconsin Cow Testing Association Register of Production shall be considered a part of the cooperative project of the Wisconsin Dairymen's Association and the University of Wisconsin. The supervision and control of the Register shall be vested in the aforementioned cooperating parties and their decision shall be final in all matters pertaining to the work. The work shall be done under the direction of the secretary of the

Wisconsin Dairymen's Association and he shall authenticate all records. Appeals from the decisions or rulings of the secretary may be made to the cooperating parties above described.

2. Entry in the Register is a privilege and not a right. The secretary at his own discretion may refuse to enter a cow in the Register or issue a certificate of registry, provided he is convinced that fraud has been resorted to by the owner, herdsman, or tester.

3. The main features of the Register shall be to issue certificates for all animals that qualify, and to publish a year book giving information concerning each such animal.

4. Any cow completing a year's record in any regularly organized cow testing association in Wisconsin and making not less than 365 pounds of butter fat during the association year is eligible to registry, provided the owner of such cow is a member of an association for the following association year. If the association is not reorganized, the owner will not be debarred from entry provided he has been of service in attempting to reorganize the association.

5. Any purebred bull having two daughters from different dams that have been entered in the Wisconsin Register of Production shall be eligible for registry.

6. The fee for entry of each cow shall be \$1.00, such fee to accompany the application for registry.

7. In case a cow makes a more creditable record later, her re-entry in the Register will be secured in the same way as was the original entry.

8. All applications for entry must be filed with the secretary or such person as he shall designate, and each application shall be signed by the owner, and attested by the tester and the secretary of the association to which the cow belongs.

9. All applications for registry shall be properly recorded and preserved. For each animal admitted to the entry in the Register the owner shall be supplied with a proper Certificate of Production.

10. Records of production shall be based on the association year and not the lactation period of the cow.

11. No record will be accepted for registry unless the tester of the association supplies a complete report of the association in the "Association Ledger" or on other approved forms.

12. No cow will be recorded or certificate issued until all items in the application have been checked by those in charge of the Register with the association records on file.

13. Any incorrect entry may be expunged from the record, the certificate revoked, and such action will be published.

14. A year book will be published giving the essentials of the record, together with the name and address of the owner of the animal accepted for entry.

15. If found necessary daily milk records may be required on all cows admitted to the Register.

16. For cows qualifying two or more years in succession a special class or designation will be given in the year book and on the certificate.

GETTING THE BEST MARKET PRICE

The farmer, in selling feeds to dairy cows, has a wide choice of markets; bad, good, and very good. Few men discriminate closely enough between these markets. If a wheat buyer offers a cent or two a bushel more than other buyers, he gets our wheat; if a wool buyer offers half a cent a pound more for our wool, we sell our wool to him; but if one cow returns three dollars from a dollar's worth of feed and another only two, we scarcely notice it at all. Here we have a difference of a dollar every time each of these two cows consumes a dollar's worth of feed, and, infrequently, within a year this difference is great enough to buy a hundred dollar bond. We believe much more attention would be given to a choice of cows if we would think of them as markets for our labor and corn silage, concentrates and clover hay. Here is one place where the farmer has the market largely under his control.—U. S. Dairy Division.

REGISTER OF PRODUCTION

ADELL ASSOCIATION

Neumann, Otto, Adell

R. O. P. 1035—Belle: Gr. Holstein; 5 yrs.; fresh Jan. 20, 1920, and Dec. 7, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 11,955 lbs.; fat, 452.6 lbs.; test, 3.76 per cent.

Feed (lbs.): Pasture, 186 (days); silage, 10,566; hay, 1,633; grain, 2,313; corn fodder, 806.

R. O. P. 1036—Betty Katinka Rose, 351,391: Reg. Holstein; 4 yrs.; fresh Jan. 25, 1920 and Jan. 3, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 11,811 lbs.; fat, 401.3 lbs.; test, 3.39 per cent.

Feed (lbs.): Pasture, 182 (days); silage, 10,546; hay, 1,385; grain, 2,187; corn fodder, 806.

R. O. P. 1037—Daisy: Gr. Holstein; 2 yrs.; fresh Oct. 24, 1919 and Oct. 17, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 11,034 lbs.; fat, 386.4 lbs.; test, 3.50 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 10,506; hay, 1,783; grain, 2,796; corn fodder, 806.

R. O. P. 1038—Irene Bessie Magnet, 359,253: Reg. Holstein; 4 yrs.; fresh Feb. 8, 1920 and Jan. 17, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 11,260 lbs.; fat, 374.7 lbs.; test, 3.32 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 10,506; hay, 1,175; grain, 2,261; corn fodder, 806.

R. O. P. 1039—Johanna of Maple Lane, 261,984: Reg. Holstein; 6 yrs.; fresh Jan. 26, 1920 and Dec. 27, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 11,304 lbs.; fat, 482.6 lbs.; test, 4.26 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 10,566; hay, 1,385; grain, 2,007; corn fodder, 806.

R. O. P. 1040—Madam De Kol of Resthaven, 141,444: Reg. Holstein; 9 yrs.; fresh Feb. 20, 1920 and April 22, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 11,074 lbs.; fat, 365.6 lbs.; test, 3.31 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 11,281; hay, 1,783; grain, 2,235; corn fodder, 806.

R. O. P. 1041—Mable Parthenia Lane, 299,552: Reg. Holstein; 5 yrs.; fresh Dec. 31, 1919 and Nov. 26, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 12,231 lbs.; fat, 388.6 lbs.; test, 3.17 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 10,506; hay, 1,633; grain, 2,466; corn fodder, 806.

R. O. P. 1042—Victoria Juliet Priscilla, 469,057: Reg. Holstein; 2 yrs.; fresh Jan. 13, 1920 and Dec. 18, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 11,154 lbs.; fat, 378.8 lbs.; test, 3.3 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 10,506; hay, 1,385; grain, 2,230; corn fodder, 806.

ALLENTON-KOHLVILLE ASSOCIATION

Bartelt, Herman, Jr., R. No. 3, West Bend

R. O. P. 930—Florice: Gr. Holstein; 10 yrs.; fresh Nov. 28, 1919 and Dec. 17, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 11,196 lbs.; fat, 407.6 lbs.; test, 3.64 per cent.

Feed (lbs.): Pasture, 204 (days); silage, 6,515; alfalfa hay, 1,152; bran and corn, 346; oats, bran, oil meal and cottonseed meal, 472; oats, 93.

R. O. P. 931—Joymaid: Gr. Holstein; 3 yrs.; fresh Dec. 9, 1919 and Dec. 21, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 9,553 lbs.; fat, 365.4 lbs.; test, 3.82 per cent.

Feed (lbs.): Pasture, 204 (days); silage, 6,515; alfalfa hay, 1,152; bran and corn, 346; oats, 93; oats, bran, oil meal and cottonseed meal, 472.

Endlich, Andrew, J., West Bend

R. O. P. 932—Johanna Wingra Walker 2d, 406,073: Reg. Holstein; 3 yrs.; fresh May 29, 1919 and Sept. 25, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 11,031 lbs.; fat, 374.1 lbs.; test, 3.39 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 7,115; alfalfa and clover hay, 1,181; bran and oats, 240; bran, oats and corn, 248; bran, oats and oil meal, 552; oats, bran, corn and oil meal, 1,080.

Hose, John, Allenton

R. O. P. 933—Evelyn: Gr. Holstein; 6 yrs.; fresh Dec. 19, 1918 and Nov. 5, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 8,246 lbs.; fat, 372.9 lbs.; test, 4.52 per cent.

Feed (lbs.): Pasture, 214 (days); silage, 5,730; alfalfa hay, 1,057; clover hay, 124; bran and oil meal, 90; oats, bran, oil meal and cottonseed meal, 929.

Klumb, Christ, West Bend

R. O. P. 934—Blossom: Gr. Holstein; 5 yrs.; fresh April 4, 1920 and ———; record from April 1, 1920 to April 1, 1921.

Production: Milk, 9,517 lbs.; fat, 374.2 lbs.; test, 3.93 per cent.

Feed (lbs.): Pasture, 167 (days); silage, 5,765; clover hay, 550; corn stover or clover chaff, 588; oats, bran, gluten and oil meal, 588; oats, bran, oil meal and cottonseed meal, 1,177.

Kopp, Elias, R. 3, West Bend

R. O. P. 523—Dora: Gr. Holstein; 6 yrs.; fresh March 3, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 10,631 lbs.; fat, 392.69 lbs.; test, 3.69 per cent.

Feed (lbs.): Pasture, 164 (days); silage, 3,775; corn stover and clover chaff, 1,267; hay, 300; oats and corn and cob meal, 300; bran, 248; bran and oil meal, 300; oats, corn, bran, oil meal and cottonseed meal, 1,142; oats, corn, oil meal, gluten and bran, 248.

R. O. P. 523a—Dora: Gr. Holstein; 6 yrs.; fresh March 3, 1919 and May 24, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 11,725 lbs.; fat, 415.9 lbs.; test, 3.55 per cent.

Feed (lbs.): Pasture, 164 (days); silage, 5,450; alfalfa hay, 816; clover chaff, 728; oats, 120; bran and oil meal, 186; corn, 60; bran, corn and oil meal, 488; oats, bran, corn and oil meal, 1,173.

R. O. P. 524—Sunbeam: Gr. Holstein; 6 yrs.; fresh Nov. 5, 1918 and Oct. 1, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 9,923 lbs.; fat, 374.73 lbs.; test, 3.78 per cent.

Feed (lbs.): Pasture, 164 (days); silage, 3,775; hay, 610; corn stover and clover chaff, 1,267; grain, 2,825.

Martin, Anton, West Bend

R. O. P. 935—Rosie: Gr. Holstein; 8 yrs.; fresh Feb. 12, 1920 and Jan. 29, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 11,002 lbs.; fat, 442 lbs.; test, 4.02 per cent.

Feed (lbs.): Pasture, 164 (days); silage, 9,497; alfalfa hay, 1,382; molasses, oats, bran and oil meal, 420; oats, bran and oil meal, 372; oats, oil meal and cottonseed meal, 649.

Martin, Jacob J., West Bend

R. O. P. 936—Aggie: Gr. Holstein; 4 yrs.; fresh March 1, 1920 and April 4, 1921 (due); record from April 1, 1920 to April 1, 1921.

Production: Milk, 12,083 lbs.; fat, 462.8 lbs.; test, 3.83 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 7,716; alfalfa hay, 1,423; clover chaff, 62; bran, oats, oil meal and molasses, 360; bran and oil meal, 155; oil meal, 31; cottonseed meal, 60; oats, corn and cottonseed meal, 912.

R. O. P. 937—Ella: Gr. Holstein; 4 yrs.; fresh Feb. 26, 1919 and May 8, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 9,770 lbs.; fat, 390.1 lbs.; test, 3.99 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 7,716; alfalfa hay, 1,305; clover chaff, 62; bran and oil meal, 93; oil meal, 31; cottonseed meal, 60; oats, corn and cottonseed meal, 850.

Martin, John A., Allenton

R. O. P. 938—Fannie: Gr. Shorthorn; 6 yrs.; fresh Oct. 15, 1919 and Oct. 3, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 8,610 lbs.; fat, 383.8 lbs.; test, 4.46 per cent.

Feed (lbs.): Pasture, 167 (days); silage, 7,400; alfalfa hay, 945; clover chaff, 844; oats, bran and corn, 548; oats, bran and cottonseed meal, 550; oats, bran, corn, oil meal and cottonseed meal, 962.

R. O. P. 939—Molly: Gr. Shorthorn; 7 yrs.; fresh Nov. 24, 1919 and Oct. 24, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 9,789 lbs.; fat, 416.6 lbs.; test, 4.26 per cent.

Feed (lbs.): Pasture, 167 (days); silage, 6,500; alfalfa hay, 945; clover chaff, 844; oats, bran and corn, 548; oats, bran and cottonseed meal, 550; oats, bran, corn, oil meal and cottonseed meal, 962.

Mayer, John C., West Bend

R. O. P. 525—Blessy: Gr. Holstein; 5 yrs.; fresh Nov. 29, 1918 and Nov. 9, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 12,754 lbs.; fat, 467.21 lbs.; test, 3.62 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 10,010; hay, 2,000; dairy feed, oats, barley and gluten, 395; oats and bran, 491; dairy feed, oats, barley, bran, oil meal, corn and cottonseed meal, 1,452.

R. O. P. 525a—Blessy: Gr. Holstein; 6 yrs.; fresh Nov. 9, 1919 and Oct. 20, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 13,771 lbs.; fat, 458.3 lbs.; test, 3.33 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 7,600; alfalfa hay, 2,337; grain, 2,491.

R. O. P. 526—Johanna Walker Wingra, 330,590: Reg. Holstein; 3 yrs.; fresh Dec. 23, 1918 and Nov. 17, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 12,101 lbs.; fat, 406.2 lbs.; test, 3.36 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 10,010; hay, 2,000; grain, 2,338.

R. O. P. 526a—Johanna Walker Wingra, 330,590: Reg. Holstein; 4 yrs.; fresh Nov. 7, 1919 and Oct. 22, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 14,705 lbs.; fat, 453.4 lbs.; test, 3.08 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 9,100; alfalfa hay, 2,332; grain, 2,363.

R. O. P. 527—Johanna Wingra Walker De Kol, 344,379: Reg. Holstein; 2 yrs.; fresh Feb. 6, 1919 and Jan. 10, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 11,991 lbs.; fat, 365.14 lbs.; test, 3.05 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 10,010; hay, 2,000; grain, 1,969.

R. O. P. 527a—Johanna Wingra Walker De Kol, 344,379: Reg. Holstein; 3 yrs.; fresh Jan. 11, 1920 and Dec. 7, 1920; record April 1, 1920 to April 1, 1921.

Production: Milk, 13,430 lbs.; fat, 372.9 lbs.; test, 2.78 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 9,100; alfalfa hay, 2,182; oats, barley, bran, corn, oil meal, cottonseed meal and dairy feed, 610; oats, corn, cottonseed meal and oil meal, 214; barley, bran, oil meal and cottonseed meal, 120; oats, bran, corn, oil meal and cottonseed meal, 1,080.

R. O. P. 940—Brooksy Johanna Walker De Kol, 564,087: Reg. Holstein; 2 yrs.; fresh Feb. 24, 1920 and Jan. 5, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 12,010 lbs.; fat, 372.7 lbs.; test, 3.10 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 4,890; alfalfa hay, 2,275; grain, 1,908.

R. O. P. 941—Fanny: Gr. Holstein; 5 yrs.; fresh Dec. 21, 1919 and Dec. 23, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 12,730 lbs.; fat, 367.8 lbs.; test, 2.89 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 9,100; alfalfa hay, 2,337; grain, 1,512.

Moritz, Arthur, West Bend

R. O. P. 942—Daisy: Gr. Holstein; 9 yrs.; fresh Dec. 15, 1918 and July 1, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 10,147 lbs.; fat, 366 lbs.; test, 3.61 per cent.

Feed (lbs.): Pasture, 214 (days); silage, 5,069; straw, 300; clover chaff, 372; oats, bran, oil meal and cottonseed meal, 1,052.

Moritz, Paul C., West Bend

R. O. P. 943—Bessie: Gr. Holstein; 13 yrs.; fresh Dec. 11, 1919 and Nov. 16, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 11,824 lbs.; fat, 436.2 lbs.; test, 3.69 per cent.

Feed (lbs.): Pasture, 164 (days); silage, 7,326; alfalfa hay, 2,362; grain, 2,700.

R. O. P. 944—Jewel Colantha Paul, 156,893: Reg. Holstein; 10 yrs.; fresh Sept. 12, 1919 and Oct. 13, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 10,816 lbs.; fat, 365.9 lbs.; test, 3.38 per cent.

Feed (lbs.): Pasture, 164 (days); silage, 7,326; alfalfa hay, 2,362; dairy feed, oil meal, oats, bran and corn, 915; oats, bran, cottonseed and oil meal, 170; oats, oil meal, cottonseed meal and hominy, 705; oats, bran, corn, oil meal and cottonseed meal, 372; oats, 120.

R. O. P. 945—Maple: Gr. Holstein; 7 yrs.; fresh Feb. 16, 1919 and April 25, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 9,611 lbs.; fat, 411.4 lbs.; test, 4.28 per cent.

Feed (lbs.): Pasture, 164 (days); silage, 7,326; alfalfa hay, 2,098; grain, 2,726.

Pamperin, Fred, West Bend

R. O. P. 528—Bess: Gr. Holstein; 5 yrs.; fresh March 1, 1919 and March 7, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 12,137 lbs.; fat, 423.5 lbs.; test, 3.49 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 6,940; hay, 1,540; grain, 1,794.

R. O. P. 529—Blacky: Gr. Holstein; 5 yrs.; fresh Nov. 28, 1918 and Oct. 29, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 12,004 lbs.; fat, 444.1 lbs.; test, 3.7 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 6,940; hay, 1,876; grain, 1,870.

R. O. P. 530—Blossom: Gr. Holstein; 4 yrs.; fresh Dec. 5, 1918 and Nov. 3, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 11,996 lbs.; fat, 374.93 lbs.; test, 3.13 per cent.

Feed (lbs.): Pasture, 184 (days); oats and barley, 515; oats, oil meal and bran, 1,016; oats, corn and oil meal, 248; silage, 6,940, hay, 1,570.

R. O. P. 531—Peaches: Gr. Holstein; 7 yrs.; fresh May 10, 1918 and May 18, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 10,918 lbs.; fat, 370.10 lbs.; test, 3.39 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 6,950; hay, 1,570; grain, 1,248.

R. O. P. 532—Pearl: Gr. Holstein; 5 yrs.; fresh Dec. 12, 1918 and Dec. 27, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 10,584 lbs.; fat, 370.7 lbs.; test, 3.5 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 6,940; hay, 1,570; grain, 2,116.

Pamperin, George, R. 1, Allenton

R. O. P. 533—June: Gr. Holstein; 5 yrs.; fresh April 11, 1918 and April 20, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 10,583 lbs.; fat, 382.5 lbs.; test, 3.61 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 5,940; hay, 2,030; grain, 1,648.

R. O. P. 534—Lucy: Gr. Holstein; 8 yrs.; fresh Oct. 14, 1918 and Oct. 24, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 12,941 lbs.; fat, 446.78 lbs.; test, 3.45 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 5,940; hay, 1,730; oats, barley, oil meal and bran, 408; oats, oil meal, bran, dairy feed and cottonseed meal, 1,327.

Pamperin, Louis, R. 3, West Bend

R. O. P. 535—Carry: Gr. Holstein; 5 yrs.; fresh March 15, 1918 and May 30, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 10,931 lbs.; fat, 453.5 lbs.; test, 4.14 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,932; hay, 2,457; grain, 2,011.

R. O. P. 536—Daisy: Gr. Holstein; 2 yrs.; fresh April 2, 1918 and May 21, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 9,968 lbs.; fat, 409.63; test, 4.12 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,932; hay, 2,457; grain, 1,672.

R. O. P. 536a—Daisy: Gr. Holstein; 3 yrs.; fresh May 21, 1919 and Sept. 23, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 11,880 lbs.; fat, 451.1 lbs.; test, 3.80 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 7,265; alfalfa hay, 2,399; oats, bran, oil meal, dairy feed and cottonseed meal, 300; bran and cottonseed meal, 186; oats and oil meal, 426; oats, oil meal and cottonseed meal, 1,271; oats, oil meal and corn, 308.

R. O. P. 537—Maud: Gr. Holstein; 7 yrs.; fresh Nov. 5, 1918 and Oct. 29, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 12,273 lbs.; fat, 410.52 lbs.; test, 3.34 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,932; hay, 2,457; oats, mill feed, cottonseed, gluten and oil meal, 454; bran and oats, 124; oats, bran and oil meal, 240; oats, mill feed, corn, cottonseed, oil meal and bran, 1,390.

R. O. P. 946—Mamsell Colantha Piebe: ———; 3 yrs.; fresh Dec 4, 1919 and Nov. 28, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 12,599 lbs.; fat, 466.2 lbs.; test, 3.65 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 7,265; alfalfa hay, 2,461; oats, bran, oil meal, dairy feed and cottonseed meal, 360; bran and cottonseed meal, 248; oats, oil meal and cottonseed meal, 1,488; oats, oil meal and corn, 420.

R. O. P. 947—Spotty: Gr. Holstein; 5 yrs.; fresh Dec. 24, 1919 and Dec. 7, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 15,441 lbs.; fat, 445.3 lbs.; test, 2.88 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 8,955; alfalfa hay, 1,970; bran, and cottonseed feed, 310; oats, 214; oats, oil meal and cottonseed meal, 1,178; oats, oil meal and corn, 476; oats, bran, oil meal, dairy feed and cottonseed feed, 300.

R. O. P. 948—Victoria: Gr. Holstein; 3 yrs.; fresh Nov. 3, 1919 and Oct. 17, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 10,518 lbs.; fat, 391.4 lbs.; test, 3.72 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 7,265; alfalfa hay, 2,399; oats, bran, dairy feed, cottonseed meal and oil meal, 300; bran and cottonseed feed, 155; oats and oil meal, 240; oats, oil meal and cottonseed meal, 1,023; oats, oil meal and corn, 224.

Pamperin, William, Allenton, R. 1

R. O. P. 538—Cedar Lawn Lizza Johanna 2d, 256,274: Reg. Holstein; 5 yrs.; fresh Dec. 26, 1918 and Jan. 17, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 12,936 lbs.; fat, 409.96 lbs.; test, 3.17 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 9,400; hay, 2,358; grain, 3,182.

R. O. P. 539—Lady Gelsche Walker De Kol, ———: Reg. Holstein; 3 yrs.; fresh Oct. 3, 1918 and Oct. 19, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 11,674 lbs.; fat, 390.22 lbs.; test, 3.33 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 8,200; hay, 2,358; grain, 3,118.

R. O. P. 539a—Lady Gelsche Walker De Kol, 298,876: Reg. Holstein; 4 yrs.; fresh Sept. 10, 1919 and Oct. 9, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 14,008 lbs.; fat, 453.9 lbs.; test, 3.24 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 10,660; hay, 2,603; oats, bran, corn, oil meal and cottonseed meal, 2,488.

R. O. P. 540—Mae: Gr. Holstein; 5 yrs.; fresh Nov. 1, 1918 and Oct. 27, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 13,048 lbs.; fat, 420.17 lbs.; test, 3.22 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 8,505; hay, 2,358; grain, 3,121.

R. O. P. 541—Viola: Gr. Holstein; 6 yrs.; fresh Feb. 4, 1919 and Feb. 27, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 14,623 lbs.; fat, 429.5 lbs.; test, 2.94 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 8,810; hay, 1,998; oats, barley and bran, 858; oats, dairy feed and cottonseed meal, 728; bran, oil meal, cottonseed meal, dairy feed and oats, 1,478.

Roecker, Charles, R. 6, West Bend

R. O. P. 949—Daisy: Gr. Holstein; 4 yrs.; fresh Jan. 5, 1920 and Jan. 3, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 10,318 lbs.; fat, 385.6 lbs.; test, 3.74 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 9,007; clover hay, 1,020; clover chaff, 676; oats, barley and bran, 426; oats and barley, 472; oil meal, 30; cottonseed meal, 31; oats, 240.

R. O. P. 950—Julia: Gr. Holstein; 8 yrs.; fresh Sept. 2, 1919 and Dec. 20, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 10,346 lbs.; fat, 378.2 lbs.; test, 3.66 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 9,007; clover hay, 1,020; oats, barley and bran, 244; oats and barley, 472; oil meal, 30; cottonseed meal, 31; clover chaff, 676; oats, 248.

R. O. P. 951—Violet: Gr. Holstein; 6 yrs.; fresh Oct. 23, 1919 and Sept. 22, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 13,929 lbs.; fat, 440.7 lbs.; test, 3.16 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 9,691; clover hay, 1,020; clover chaff, 676; oats, barley and bran, 548; oats and barley, 840; oil meal, 30; cottonseed meal, 31; oats, 248.

Rosenthal, C. F., West Bend

R. O. P. 542—Lottie Johanna Fobes, 307,207: Reg. Holstein; 4 yrs.; fresh March 15, 1919 and Feb. 26, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 12,222 lbs.; fat, 437.6 lbs.; test, 3.55 per cent.

Feed (lbs.): Pasture, 166 (days); silage, 5,538; hay, 2,577; oats, barley, bran, dairy feed and cottonseed meal, 670; bran and dairy feed, 183; oats, bran, dairy feed and oil meal, 651; oats, bran, dairy feed, cottonseed meal, oil meal and gluten, 1,210.

R. O. P. 542a—Lottie Johanna Fobes, 307,207: Reg. Holstein; 5 yrs.; fresh Feb. 27, 1920 and March 6, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 14,394 lbs.; fat, 531.0 lbs.; test, 3.69 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 4,540; alfalfa and clover hay, 1,602; corn fodder, 120; beets, 920; mixed grain, 3,076.

R. O. P. 543—May Johanna De Kol Fobes, 266,974: Reg. Holstein; 5 yrs.; fresh Sept. 30, 1918; record from April 1, 1919 to April 1, 1920.

Production: Milk, 10,266 lbs.; fat, 387.84 lbs.; test, 3.78 per cent.

Feed (lbs.): Pasture, 166 (days); silage, 5,538; hay, 2,577; grain, 2,500.

R. O. P. 952—Mabel Johanna Fobes, 269,163: Reg. Holstein; 6 yrs.; fresh Feb. 1, 1920 and Jan. 25, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 12,099 lbs.; fat, 382.2 lbs.; test, 3.16 per cent.

Food (lbs.): Pasture, 153 (days); silage, 2,370; clover and alfalfa hay, 1,018; mixed grain, 2,246.

R. O. P. 953—Selma Johanna Burke 2d, 350,756: Reg. Holstein; fresh March 19, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 12,657 lbs.; fat, 372.9 lbs.; test, 2.95 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 4,540; clover and alfalfa hay, 1,602; corn fodder, 120; beets, 920; mixed grain, 2,313.

Siegfried, Henry, R. 3, West Bend

R. O. P. 954—Nora: Gr. Holstein; 9 yrs.; fresh Feb. 20, 1920 and March 29, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 10,601 lbs.; fat, 368.8 lbs.; test, 3.48 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 4,835; clover and alfalfa hay, 1,028; clover chaff, 371; oats, bran, corn and oil meal, 300; oats, bran and oil meal, 843.

ALTO ASSOCIATION

Redeker and Vossekiul, Brandon

R. O. P. 727—Glow's Rosette: Gr. Jersey; 7 yrs.; fresh Jan. 10, 1919 and Dec. 3, 1919; record from June 1, 1919 to June 1, 1920.

Production: Milk, 8,191 lbs.; fat, 423.7 lbs.; test, 5.17 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 5,266; hay, 1,212; stover, 1,204; grain, 2,052.

R. O. P. 728—Marica of Lodoga: Reg. Jersey; 8 yrs.; fresh October, 1918, and Nov. 6, 1919; record from June 1, 1919 to June 1, 1920.

Production: Milk, 8,775 lbs.; fat, 411 lbs.; test, 4.68 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 5,272; hay, 1,212; stover, 1,204; grain, 2,167.

ANSTON BROWN CO. ASSOCIATION

Cumps, Louis, Jr., Green Bay

R. O. P. 455—No. 7: Gr. Holstein; 6 yrs.; fresh Feb. 4, 1919; record from Jan. 20, 1919 and Jan. 20, 1920.

Production: Milk, 7,695 lbs.; fat, 371.2 lbs.; test, 4.33 per cent.

Feed (lbs.): Pasture, 182 (days); silage, 8,540; hay, 1,950; grain, 1,090

Herber, Peter, Green Bay

R. O. P. 440—Daisy Derries Paul 2d, 169,460: Reg. Holstein; 7 yrs.; fresh Oct. 8, 1919; record from Jan. 20, 1919 to Jan. 20, 1920.

Production: Milk, 13,351 lbs.; fat, 463.8 lbs.; test, 4.26 per cent.

Feed (lbs.): Pasture, 166 (days); silage, 6,450; mixed hay, 2,250; grain, 2,840.

R. O. P. 441—Eva No. 2: Gr. Holstein; 5 yrs.; fresh Sept 8, 1918 and Sept. 12, 1919; record from Jan. 20, 1919 to Jan. 20, 1920.

Production: Milk, 11,446 lbs.; fat, 420.9 lbs.; test, 3.73 per cent.

Feed (lbs.): Pasture, 167 (days); silage, 6,450; hay, 2,250; grain, 2,778.

R. O. P. 442—Jewel Surprise Johanna, 233,498: Reg. Holstein; 6 yrs.; fresh Sept. 9, 1918 and Sept 13, 1919; record from Jan. 20, 1919 to Jan. 20, 1920.

Production: Milk, 10,293 lbs.; fat, 388.6 lbs.; test, 3.94 per cent.

Feed (lbs.): Pasture, 136 (days); silage, 6,450; clover and alfalfa hay, 2,250; grain, 2,648.

R. O. P. 443—Lady Bessie Beets, 316,674: Reg. Holstein; 3 yrs.; fresh Sept. 20, 1918 and Oct. 13, 1919; record from Jan. 20, 1919 to Jan. 20, 1920.

Production: Milk, 11,767 lbs.; fat, 401 lbs.; test, 3.80 per cent.

Feed (lbs.): Pasture, 182 (days); silage, 6,450; mixed hay, 2,250; grain, 2,440.

R. O. P. 444—Katrina Jewel De Kol 2d, 270,798: Reg. Holstein; 5 yrs.; fresh Oct. 28, 1919; record from Jan. 20, 1919 to Jan. 20, 1920.

Production: Milk, 10,696 lbs.; fat, 370.9 lbs.; test, 3.52 per cent.

Feed (lbs.): Pasture, 166 (days); silage, 6,450; mixed hay, 2,250; grain, 2,490.

R. O. P. 445—Nancy Douglass, 316,675: Reg. Holstein; 3 yrs.; fresh Feb. 16, 1918 and Feb. 8, 1919; record from Jan. 20, 1919 to Jan. 20, 1920.

Production: Milk, 13,970 lbs.; fat, 439.9; test, 3.50 per cent.

Feed (lbs.): Pasture, 167 (days); silage, 6,450; mixed hay, 2,250; grain, 2,450.

R. O. P. 446—Snake: Gr. Holstein; 5 yrs.; fresh Jan. 1, 1919 and Jan. 20, 1920; record from Jan. 20, 1919 to Jan. 20, 1920.

Production: Milk, 11,779 lbs.; fat, 391.5 lbs.; test, 3.35 per cent.

Feed (lbs.): Pasture, 167 (days); silage, 6,450; mixed hay, 2,250; grain, 2,360.

Larsen, William, Green Bay

R. O. P. 447—No. 33: Gr. Guernsey; 5 yrs.; fresh March 10, 1919; record from Jan. 20, 1919 to Jan. 20, 1920.

Production: Milk, 8,101 lbs.; fat, 384.9 lbs.; test, 4.75 per cent.

Feed (lbs.): Pasture, 151 (days); pea vines, 2,060; alfalfa hay, 2,450; grain, 1,090; corn silage, 6,840; clover hay, 360.

R. O. P. 448—No. 53: Gr. Guernsey; 6 yrs.; fresh Dec. 28, 1918; record from Jan. 20, 1919 to Jan. 1920.

Production: Milk, 6,998 lbs.; fat, 366.1 lbs.; test, 5.38 per cent.

Feed (lbs.): Pasture, 121 (days); corn silage, 6,840; pea vines, 2,060; alfalfa hay, 2,030; grain, 960; clover hay, 780.

ARKANSAW ASSOCIATION

Harmon, William, Arkansaw

R. O. P. 885—Bell: Gr. Guernsey; 4 yrs.; fresh Nov. 2, 1920 and March 17, 1921; record from Aug. 29, 1919 to Aug. 29, 1920.

Production: Milk, 8,729 lbs.; fat, 404 lbs.; test, 4.63 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 6,798; hay, 1,310; fodder, 905; barley, 582; oats, 1,166; oil meal, 252; bran, 124; corn, 151.

R. O. P. 886—Daisy: Gr. Guernsey; 4 yrs.; fresh Feb. 26, 1920 and Jan. 21, 1921; record from Aug. 29, 1919 to Aug. 29, 1920.

Production: Milk, 6,933 lbs.; fat, 395.5 lbs.; test, 5.70 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 6,798; hay, 1,310; fodder, 905; barley, 552; oats, 1,107; oil meal, 224; bran, 124; corn, 138.

R. O. P. 887—Lilly Grey, 64,168: Reg. Guernsey; 4 yrs.; fresh Dec. 29, 1919 and Dec. 15, 1920; record from Aug. 29, 1919 to Aug. 29, 1920.

Production: Milk, 6,855 lbs.; fat, 369.2 lbs.; test, 5.38 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 6,488; hay, 1,310; fodder, 905; barley, 477; oats, 954; oil meal, 259; bran, 248; corn, 127.

R. O. P. 888—Molly: Gr. Guernsey; 6 yrs.; fresh Oct. 7, 1919 and Nov. 3, 1920; record from Aug. 29, 1919 to Aug. 29, 1920.

Production: Milk, 8,141 lbs.; fat, 461.9 lbs.; test, 5.67 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 6,798; hay, 1,310; fodder, 905; barley, 646; oats, 1,292; oil meal, 366; corn, 134; cottonseed meal, 35; bran, 248.

R. O. P. 889—Philistine: Gr. Guernsey; 10 yrs.; fresh Feb. 16, 1919 and Jan. 13, 1920; record from Aug. 29, 1919 to Aug. 29, 1920.

Production: Milk, 8,715 lbs.; fat, 432.6 lbs.; test, 4.96 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 6,798; hay, 1,310; fodder, 905; barley, 610; oats, 1,214; oil meal, 315; corn, 176; bran, 212.

R. O. P. 890—Topsy: Gr. Guernsey; 6 yrs.; fresh March 18, 1919 and April 17, 1920; record from Aug. 29, 1919 to Aug. 29, 1920.

Production: Milk, 8,429 lbs.; fat, 392.6 lbs.; test, 4.66 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 6,798; hay, 1,310; fodder, 905; barley, 503; oats, 1,003; oil meal, 152; bran, 56; corn, 88.
Hoffman, Henry and George, Arkansaw

R. O. P. 891—Viola Rose: Gr. Guernsey; 4 yrs.; fresh Sept. 11, 1919 and Nov. 26, 1920; record from Aug. 8, 1919 to Aug. 8, 1920.

Production: Milk, 8,343 lbs.; fat, 413.6 lbs.; test, 4.90 per cent.

Feed (lbs.): Pasture, 151 (days); corn silage, 5,241; clover, 1,484; barley, 596; oats, 1,092; bran, 152; oil meal, 154.

Krings, Peter, Arkansaw

R. O. P. 892—Fannie: Gr. Guernsey; 6 yrs.; fresh Nov. 28, 1919 and Oct. 18, 1920; record from July 19, 1919 to July 19, 1920.

Production: Milk, 8,555 lbs.; fat, 368.1 lbs.; test, 4.3 per cent.

Feed (lbs.): Pasture, 178 (days); silage, 4,423; clover hay, 2,070; straw, 870; barley, 477; oats, 721; bran, 741; corn, 246; cottonseed meal, 48; oil meal, 340.

R. O. P. 893—Jennie: Gr. Guernsey; 4 yrs.; fresh Jan. 22, 1920 and Dec. 1, 1920; record from July 19, 1919 to July 19, 1920.

Production: Milk, 8,563 lbs.; fat, 398.8 lbs.; test, 4.66 per cent.

Feed (lbs.): Pasture, 179 (days); silage, 4,463; clover, 2,070; straw, 870; barley, 438; oats, 579; bran, 599; corn, 142; cottonseed, 30; oil meal, 154.

R. O. P. 894—Magnolias Daughter, 73,879: Reg. Guernsey; 2 yrs.; fresh June 15, 1919 and July 1, 1920; record from July 19, 1919 to July 19, 1920.

Production: Milk, 7,470 lbs.; fat, 373.4 lbs.; test, 5 per cent.

Feed (lbs.): Pasture, 179 (days); silage, 4,459; clover, 2,070; straw, 870; barley, 383; oats, 434; bran, 379; oil meal, 144; corn, 196.

Siewwright, C. E., Arkansaw

R. O. P. 895—Lily: Gr. Guernsey; 6 yrs.; fresh May 10, 1919 and April 22, 1920; record from Aug. 2, 1919 to Aug. 2, 1920.

Production: Milk, 7,049 lbs.; fat, 379.4 lbs.; test, 5.38 per cent.

Feed (lbs.): Pasture, 182 (days); hay, 1,645; fodder, 3,960; barley, 167; oats, 935; bran, 109; corn, 340; oil meal, 30.

Kraak, William, Muscoda

R. O. P. 896—Geller: Gr. Holstein; 5 yrs.; fresh March 12, 1920 and Jan. 12, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 10,556 lbs.; fat, 369.4 lbs.; test, 3.50 per cent.

Feed (lbs.): Pasture, 193 (days); silage, 4,310; timothy hay, 563; clover hay, 180; corn fodder, 953; corn and oats, 98; corn and cob meal, 104.

AVOCA ASSOCIATION

Malter, J. J. & Son, Avoca

R. O. P. 897—Ruby Segis Beauty, 382,605: Reg. Holstein; 4 yrs.; fresh Nov. 5, 1919 and Jan. 6, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 10,177 lbs.; fat, 369.5 lbs.; test, 3.63 per cent.

Feed (lbs.): Pasture, 178 (days); silage, 4,140; timothy hay, 204; wild hay, 1,208; alfalfa hay, 364; mixed hay, 204; corn and cob meal, 297; barley, 195; oats, 575; cottonseed meal, 87; oil meal, 93.

BARNEVELD ASSOCIATION

Arneson, H. A., Barneveld

R. O. P. 955—Mary Ormsby Rijanet, 137,752: Reg. Holstein; 10 yrs.; fresh Jan. 21, 1921 and Feb. 15, 1920; record from March 31, 1920 to March 31, 1921.

Production: Milk, 11,681 lbs.; fat, 365.7 lbs.; test, 3.13 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 7,830; hay, 1,805; grain, 2,248.

R. O. P. 956—Maud Mercedes Veemen De Kol, 220,369: Reg. Holstein; 7 yrs.; fresh April 17, 1920 and April 8, 1919; record from March 3, 1920 to March 3, 1921.

Production: Milk, 11,136 lbs.; fat, 367 lbs.; test, 3.3 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 7,165; hay, 1,805; grain, 2,195.

R. O. P. 957—Ruffina Ormsby Pontiac, 172,784: Reg. Holstein; 9 yrs.; fresh April 3, 1919 and March 30, 1920; record from March 3, 1920 to March 3, 1921.

Production: Milk, 14,907 lbs.; fat, 465.7 lbs.; test, 3.12 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 7,345; hay, 1,805; grain, 3,075.

Brigham, Chas. I., Blue Mounds

R. O. P. 493—Rosalind Johanna Korndyke, 298,011: Reg. Holstein; 3 yrs.; fresh Feb. 2, 1919 and Feb. 8, 1920; record from March 6, 1919 to March 6, 1920.

Production: Milk, 14,817 lbs.; fat, 507.8 lbs.; test, 3.43 per cent

Feed (lbs.): Pasture, 188 (days); silage, 10,365; hay, 1,635; grain, 4,675.

Campbell, Archibald G., Barneveld

R. O. P. 494—Ruffina Pauline, 160,642: Reg. Holstein; 7 yrs.; fresh Feb. 19, 1919 and Jan. 22, 1920; record from Feb. 28, 1919 to Feb. 28, 1920.

Production: Milk, 10,097 lbs.; fat, 378.9 lbs.; test, 3.75 per cent.

Feed (lbs.): Pasture, 198 (days); silage, 7,910; hay, 1,740; grain, 2,710; fodder, 455.

R. O. P. 925—Paulina De Kol Witkop Pontiac, 267,912: Reg. Holstein; 5 yrs.; fresh April 13, 1919 and March 22, 1920; record from Feb. 28, 1920 to Feb. 28, 1921.

Production: Milk, 14,112 lbs.; fat, 443.5 lbs.; test, 3.14 per cent.

Feed (lbs.): Pasture, 178 (days); silage, 7,695; hay, 1,425; beets, 500; grain, 3,020.

Collins, C. R., Blue Mounds

R. O. P. 495—Nig: Gr. Holstein; 8 yrs.; fresh April 6, 1918 and March 1, 1919; record from March 4, 1919 to March 4, 1920.

Production: Milk, 10,454 lbs.; fat, 372.5 lbs.; test, 3.56 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 3,165; hay, 2,120; straw, 455; grain, 1,445.

R. O. P. 898—Nig: Gr. Holstein; 9 yrs.; fresh March 1, 1919 and March 18, 1920; record from March 4, 1920 to March 4, 1921.

Production: Milk, 10,438 lbs.; fat, 374.7 lbs.; test, 3.59 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 3,955; hay, 2,430; grain, 1,345.

Ruste, Olin, Blue Mounds

R. O. P. 280b—Gerda Beryl Wayne De Kol, 148,351: Reg. Holstein; 9 years.; fresh Feb. 21, 1919 and Feb. 25, 1920; record from Feb. 29, 1920 to March 1, 1921.

Production: Milk, 11,510 lbs.; fat, 374.7 lbs.; test, 3.26 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 8,975; hay, 1,970; grain, 2,930.

R. O. P. 469—Cassy Belle Wayne, 148,353: Reg. Holstein; 9 yrs.; fresh March 10, 1919 and Feb. 23, 1920; record from Feb. 28, 1919 to Feb. 29, 1920.

Production: Milk, 11,344 lbs.; fat, 373.4 lbs.; test, 3.3 per cent.

Feed (lbs.): Pasture, 188 (days); silage, 8,780; hay, 1,770; grain, 3,545.

R. O. P. 470—Clarissa Canary Ringwood, 310,305: Reg. Holstein; 4 yrs.; fresh March 15, 1919 and Feb. 5, 1920; record from Feb. 28, 1919 to Feb. 29, 1920.

Production: Milk, 10,808 lbs.; fat, 372.3 lbs.; test, 3.45 per cent.

Feed (lbs.): Pasture, 188 (days); silage, 8,730; beets, 80; hay, 1,770; grain, 3,170.

R. O. P. 471—Climax Prilly Mayo, 267,510: Reg. Holstein; 4 yrs.; fresh Feb. 21, 1919 and Feb. 3, 1920; record from Feb. 28, 1919 to Feb. 29, 1920.

Production: Milk, 9,962 lbs.; fat, 370.5 lbs.; test, 3.74 per cent.

Feed (lbs.): Pasture, 188 (days); silage, 8,840; hay, 1,770; grain, 2,910;

R. O. P. 472—Gerda Beryl Wayne De Kol, 148,351: Reg. Holstein; 8 yrs.; fresh Feb. 21, 1919 and Feb. 23, 1920; record from Feb. 28, 1919 to Feb. 29, 1920.

Production: Milk, 13,182 lbs.; fat, 427 lbs.; test, 3.25 per cent.

Feed (lbs.): Pasture, 188 (days); silage, 8,650; hay, 1,680; straw, 125; grain, 3,945.

R. O. P. 496a—Cassy Belle Wayne, 148,353: Reg. Holstein, 10 yrs.; fresh March 10, 1919 and Feb. 23, 1920; record from Feb. 28, 1920 to Feb. 28, 1921.

Production: Milk, 16,715 lbs.; fat, 548.7 lbs.; test, 3.28 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 8,975; hay, 1,970; grain, 3,710.

R. O. P. 794—Canary Akke Witten De Kol, 359,686: Reg. Holstein; 3 yrs.; fresh March 1, 1919 and Feb. 25, 1920; record from Feb. 28, 1920 to Feb. 28, 1921.

Production: Milk, 11,603 lbs.; fat, 381.9 lbs.; test, 3.29 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 8,970; hay, 1,970; grain, 2,825.

R. O. P. 795—Canary Annette De Kol, 310,303: Reg. Holstein; 4 yrs.; fresh Feb. 25, 1920 and Feb. 11, 1921; record from Feb. 28, 1920 to Feb. 28, 1921.

Production: Milk, 12,353 lbs.; fat, 418.3 lbs.; test, 3.38 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 8,975; hay, 1,970; grain, 2,975.

R. O. P. 797—Clarissa Canary Ringwood, 310,305: Reg. Holstein; 4 yrs.; fresh March 15, 1919 and Feb. 5, 1920; record from Feb. 28, 1920 to Feb. 28, 1921.

Production: Milk, 11,706 lbs.; fat, 408.2 lbs.; test, 3.49 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 8,975; hay, 1,970; grain, 3,065.

R. O. P. 798—Inka Harriette Pietertje De Kol, 169,023: Reg. Holstein; 8 yrs.; fresh Feb. 5, 1920 and Feb. 15, 1921; record from Feb. 28, 1920 to Feb. 28, 1921.

Production: Milk, 11,085 lbs.; fat, 435.5 lbs.; test, 3.93 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 8,975; hay, 1,970; grain, 2,995.

R. O. P. 799—Jaffna Aaggie Canary, 359,691: Reg. Holstein; 4 yrs.; fresh May 4, 1919 and March 28, 1920; record from Feb. 28, 1920 to Feb. 28, 1921.

Production: Milk, 12,126 lbs.; fat, 370.4 lbs.; test, 3.05 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 8,975; hay, 1,970; grain, 2,860.

R. O. P. 800—Princess Prilly Canary, 359,685: Reg. Holstein; 4 yrs.; fresh April 23, 1919 and March 18, 1920; record from Feb. 28, 1920 to Feb. 28, 1921.

Production: Milk, 10,516 lbs.; fat, 381.4 lbs.; test, 3.63 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 8,975; hay, 1,970; grain, 2,585.

Stolen, J. E., Klevenville

R. O. P. 449—Aaggie Johanna Colanthus, 244,502: Reg. Holstein; fresh Nov. 13, 1917 and Nov. 2, 1918; record from Sept. 25, 1918 to Sept. 25, 1919.

Production: Milk, 11,159 lbs.; fat, 439 lbs.; test, 4.37 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 7,275; hay, 1,970; grain, 3,385.

R. O. P. 450—Aaggie Johanna Homestead, 139,428: Reg. Holstein; 8 yrs.; fresh Oct. 1, 1917 and Oct. 11, 1918; record from Sept. 25, 1918 to Sept. 25, 1919.

Production: Milk, 13,713 lbs.; fat, 503.8 lbs.; test, 4.4 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 7,150; hay, 1,670; grain, 3,535.

R. O. P. 451—Barbara De Kol Korndyke Ormsby, 103,862: Reg. Holstein 11 yrs.; fresh Oct. 21, 1917 and Oct. 31, 1918; record from Sept. 25, 1918 to Sept. 25, 1919.

Production: Milk, 9,729 lbs.; fat, 370.6 lbs.; test, 4.35 per cent.

Feed (lbs.): Pasture, 198 (days); silage, 7,295; hay, 2,120; grain, 3,580.

R. O. P. 452—Helen Pietertje Segis Beets, 378,379: Reg. Holstein; 2 yrs.; fresh Oct. 1, 1918; record from Sept. 25, 1918 to Sept. 25, 1919.

Production: Milk, 11,289 lbs.; fat, 366.8 lbs.; test, 3.91 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 7,280; hay, 1,970; grain, 2,825.

R. O. P. 453—Madrigal De Kol Rue Canary, 256,809: Reg. Holstein; 4 yrs.; fresh Sept. 15, 1917 and Oct. 14, 1918; record from Sept. 25, 1918 to Sept. 25, 1919.

Production: Milk, 11,500 lbs.; fat, 369.1 lbs.; test, 3.67 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 8,045; hay, 2,130; grain, 2,730.

R. O. P. 454—Siam De Kol 2d, 264,991: Reg. Holstein; 4 yrs.; fresh Oct. 21, 1917 and Oct. 4, 1918; record from Sept. 25, 1918 to Sept. 25, 1919.

Production: Milk, 13,495 lbs.; fat, 491.2 lbs.; test, 4.36 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 7,275; hay, 1,970; grain, 3,360.

Thompson, Theo. N., Barneveld

R. O. P. 899—Anggie Prilly Korndyke, 285, 453: Reg. Holstein; 5 yrs.; fresh Feb. 11, 1919 and March 20, 1920; record from March 23, 1920 to March 23, 1921.

Production: Milk, 11,863 lbs.; fat, 401.3 lbs.; test, 3.38 per cent.

Feed (lbs.): Pasture, 194 (days); silage, 7,775; hay, 1,670; grain, 2,700. straw fodder, 300.

R. O. P. 900—Daisy Jule De Kol Girl, 306,473: Reg. Holstein; 5 yrs.; fresh Nov. 29, 1920; record from March 23, 1920 to March 23, 1921.

Production: Milk, 11,045 lbs.; fat, 382.9 lbs.; test, 3.47 per cent.

Feed (lbs.): Pasture, 194 (days); silage, 8,395; hay, 1,670; straw fodder, 300; grain, 2,740.

R. O. P. 901—Maud: Gr. Holstein; 10 yrs.; fresh March 20, 1920; record from March 23, 1920 to March 23, 1921.

Production: Milk, 11,853 lbs.; fat, 366.2 lbs.; test, 3.09 per cent.

Feed (lbs.): Pasture, 194 (days); silage, 7,465; hay, 1,120; straw fodder, 1,030; grain, 2,005.

R. O. P. 902—Netherland Lieunkje Johanna, 216,657: Reg. Holstein; 6 yrs.; fresh May 10, 1918 and May 6, 1919; record from March 23, 1919 to March 23, 1920.

Production: Milk, 13,405 lbs.; fat, 409.8 lbs.; test, 3.06 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 7,410; hay, 980; straw, 910; grain, 2,410.

R. O. P. 903—Netherland Lieunkje Johanna, 216,657: Reg. Holstein; 7 yrs.; fresh May 15, 1919 and July 26, 1920; record from March 23, 1920 to March 23, 1921.

Production: Milk, 11,574 lbs.; fat, 409.5 lbs.; test, 3.35 per cent.

Feed (lbs.): Pasture, 194 (days); silage, 7,475; hay, 2,720; straw fodder, 300; grain, 2,100.

R. O. P. 904—Polly: Gr. Holstein; 10 yrs.; fresh ———; record from March 23, 1920 to March 23, 1921.

Production: Milk, 11,009 lbs.; fat, 395.8 lbs.; test, 3.60 per cent.

Feed (lbs.): Pasture, 194 (days); silage, 7,365; hay, 850; straw fodder, 1,400; grain, 1,785.

Tollefson, G. O., Mount Horeb

R. O. P. 496—Countess Canary Ormsby, 309,246: Reg. Holstein; 3 yrs.; fresh Sept. 27, 1918 and Oct. 5, 1919; record from March 8, 1919 to March 8, 1920.

Production: Milk, 11,986 lbs.; fat, 403.2 lbs.; test, 3.37 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 11,150; hay, 1,860; grain, 3,755.

R. O. P. 497—Elderwood Pontiac Colanthus, ———: Reg. Holstein; 4 yrs.; fresh Oct. 8 1918 and Oct. 15, 1919; record from March 8, 1919 to March 8, 1920.

Production: Milk, 12,265 lbs.; fat, 376.6 lbs.; test, 3.09 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 11,800; hay, 1,560; grain, 4,170.

Tollefson, Lawrence, Klevenville

R. O. P. 498—Cora: Gr. Holstein; 7 yrs.; fresh April 5, 1918 and April 8, 1919; record from March 14, 1919 to March 14, 1920

Production: Milk, 11,793 lbs.; fat, 367.8 lbs.; test, 3.12 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 6,285; hay, 2,415; grain, 2,890.

R. O. P. 499—Nettie: Gr. Holstein; 3 yrs.; fresh March 28, 1918 and April 21, 1919; record from March 14, 1919 to March 14, 1920.

Production: Milk, 11,493 lbs.; fat, 377.8 lbs.; test, 3.29 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 6,285; hay, 2,415; grain, 2,885.

R. O. P. 500—Rose: Gr. Holstein; 6 yrs.; fresh Feb. 15, 1918 and March 10, 1919; record from March 14, 1919 to March 14, 1920.

Production: Milk, 11,235 lbs.; fat, 404.8 lbs.; test, 3.6 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 6,285; hay, 2,415; grain, 2,781.

R. O. P. 501—Snowball Wayne De Kol, ———: Reg. Holstein; 6 yrs.; fresh May 27, 1918 and April 11, 1919; record from March 24, 1919 to March 24, 1920.

Production: Milk, 11,685 lbs.; fat, 383.3 lbs.; test, 3.28 per cent

Feed (lbs.): Pasture, 184 (days); silage, 6,285; hay, 2,420; grain, 2,790.

Zepplin, W. H., Barneveld

R. O. P. 492—Beauty: Gr. Holstein; 4 yrs.; fresh March 7, 1918 and March 3, 1919; record from March 14, 1919 to March 14, 1920.

Production: Milk, 10,577 lbs.; fat, 391.1 lbs.; test, 3.71 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 5,515; hay, 2,475; straw, 310; grain, 2,345.

R. O. P. 502—Flossy: Gr. Holstein; 6 yrs.; fresh March 14, 1918 and March 13, 1919; record from March 14, 1919 to March 14, 1920.

Production: Milk, 11,653 lbs.; fat, 420.9 lbs.; test, 3.61 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 5,495; hay, 2,460; straw, 310; grain, 2,320.

BEAR CREEK ASSOCIATION

Raisler, C. L., Bear Creek

R. O. P. 958—Inogae De Kol Paul Pet, 116,206: Reg. Holstein; 11 yrs.; fresh Oct. 2, 1920 and Oct. 10, 1921; record from April 21, 1920 to April 21, 1921.

Production: Milk, 12,681 lbs.; fat, 418.4 lbs.; test, 3.3 per cent.

Feed (lbs.): Pasture, 161 (days); silage, 16,930; alfalfa hay, 2,721; grain, 2,626.

R. O. P. 959—Pioneer Aaggie De Kol, 242,291: Reg. Holstein; 7 yrs.; fresh Dec. 27, 1919 and Dec. 21, 1920; record from April 21, 1920 to April 24, 1921.

Production: Milk, 10,962 lbs.; fat, 397 lbs.; test, 3.62 per cent.

Feed (lbs.): Pasture, 161 (days); silage, 16,930; alfalfa hay, 2,721; grain ration, 2,108.

R. O. P. 960—Pietertje De Kol Wit, 157,735: Reg. Holstein; 9 yrs.; fresh March 7, 1920 and March 5, 1921; record from April 21, 1920 to April 21, 1921.

Production: Milk, 11,261 lbs.; fat, 384.7 lbs.; test, 3.42 per cent.

Feed (lbs.): Pasture, 161 (days); silage, 16,880; hay, 2,721; grain, 2,095.

Rolland, John Jr., Bear Creek

R. O. P. 961—Molly: Reg. Holstein; 8 yrs.; fresh Dec. 21, 1919 and Nov. 25, 1920; record from April 27, 1920 to April 27, 1921.

Production: Milk, 10,643 lbs.; fat, 402.9 lbs.; test, 3.79 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 10,309; hay, 2,544; grain, 2,151.

R. O. P. 962—Queen: Gr. Holstein; 4 yrs.; fresh March 13, 1920 and Feb. 4, 1921; record from April 27, 1920 to April 27, 1921.

Production: Milk, 11,579 lbs.; fat, 420.5 lbs.; test, 3.63 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 9,065; hay, 2,308; grain, 2,411.

R. O. P. 963—Blue Bell: Gr. Holstein; 12 yrs.; fresh Dec. 24, 1919 and Dec. 14, 1920; record from April 27, 1920 to April 27, 1921.

Production: Milk, 10,552 lbs.; fat, 414.2 lbs.; test, 3.93 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 10,309; hay, 2,544; grain, 2,271.

Schoelkopf, Albert, Bear Creek

R. O. P. 964—Beauty: Gr. Holstein; 3 yrs.; fresh Jan. 27, 1920 and Dec. 26, 1920; record from May 1, 1920 to May 1, 1921.

Production: Milk, 8,783 lbs.; fat, 374.2 lbs.; test, 4.26 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 7,704; alfalfa hay, 3,004; grain, 1,411.

R. O. P. 965—Tuzzy: Gr. Holstein; 3 yrs.; fresh Nov. 8, 1919 and Nov. 14, 1921; record from May 1, 1920 to May 1, 1921.

Production: Milk, 12,420 lbs.; fat, 409.6 lbs.; test, 3.3 per cent.

Feed (lbs.): Pasture, 138 (days); silage, 7,734; hay, 3,004; grain, 2,230.

R. O. P. 966—Maggie: Gr. Holstein; 9 yrs.; fresh April 2, 1920 and May 10, 1921; record from May 1, 1920 to May 1, 1921.

Production: Milk, 10,605 lbs.; fat, 466.9 lbs.; test, 4.4 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 7,734; hay, 3,004; grain, 1,261

R. O. P. 967—Stifle: Gr. Holstein; 5 yrs.; fresh Feb. 25, 1920 and Jan. 15, 1921; record from May 1, 1920 to May 1, 1921.

Production: Milk, 10,835 lbs.; fat, 373.3 lbs.; test, 3.17 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 7,704; hay, 3,004; grain, 1,680.

R. O. P. 968—Queen: Gr. Holstein; 11 yrs.; fresh April 4, 1920 and March 6, 1921; record from May 1, 1920 to May 1, 1921.

Production: Milk, 10,633 lbs.; fat, 404 lbs.; test, 3.80 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 7,704; hay, 3,004; grain, 1,329.

Starchaska, Max, Bear Creek

R. O. P. 969—Mulbie Johanna De Kol Fayne, ———: Reg. Holstein; 6 yrs.; fresh Nov. 7, 1919 and Nov. 21, 1920; record from April 30, 1920 to April 30, 1921.

Production: Milk, 11,978 lbs.; fat, 413.5 lbs.; test, 3.45 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 10,258; hay, 2,727; grain, 3,483.

BONDUEL ASSOCIATION

Debban, Robert, R. 1, Shawano

R. O. P. 432—Nellie: Native; 10 yrs.; fresh Feb. 15, 1918 and Jan. 1, 1919; record from Nov. 1, 1918 to Nov. 1, 1919.

Production: Milk, 10,142 lbs.; fat, 423.3 lbs.; test, 4.17 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,350; mixed hay, 1,706; barley, bran, oats and oil meal, 2,046.

Frazer, J. W., R. 2, Pulaski

R. O. P. 433—Splutter: Gr. Holstein; 10 yrs.; fresh Dec. 28, 1917 and Jan. 30, 1919; record from Nov. 1, 1918 to Nov. 1, 1919.

Production: Milk, 9,987 lbs.; fat, 397.5 lbs.; test, 3.9 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 12,310; hay, 830; ground feeds, 1,044.

R. O. P. 434—Lady Mike: Gr. Guernsey; 2 yrs.; fresh March 15, 1918 and Feb. 26, 1919; record from Nov. 1, 1918 to Nov. 1, 1919.

Production: Milk, 7,611 lbs.; fat, 385.7 lbs.; test, 5 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 12,310; hay, 830; mixed feeds, 1,062.

Mueller, Herman C., R. 1, Shawano

R. O. P. 435—Beauty: Gr. Holstein; 4 yrs.; fresh Sept. 14, 1917 and Dec. 18, 1918; record from Oct. 1, 1918 to Sept. 30, 1919.

Production: Milk, 9,646 lbs.; fat, 391.2 lbs.; test, 4.05 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,230; clover hay, 2,136; barley, oats, bran and oil meal, 1,800.

R. O. P. 436—Blossom: Gr. Holstein; 3 yrs.; fresh Oct. 18, 1917 and Oct. 26, 1918; record from Oct. 1, 1918 to Sept. 30, 1919.

Production: Milk, 9,252 lbs.; fat, 414.3 lbs.; test, 4.47 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,230; clover hay, 2,136; barley, oats, bran and oil meal, 1,841.

R. O. P. 437—Gypsy: Gr. Holstein; 8 yrs.; fresh Sept. 30, 1918 and April 18, 1917; record from Oct. 1, 1918 to Sept. 30, 1919.

Production: Milk, 12,937 lbs.; fat, 454.3 lbs.; test, 3.52 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,230; clover hay, 2,136; barley, oats, bran and oil meal, 2,227.

R. O. P. 439—Winona: Gr. Holstein; 8 yrs.; fresh Aug. 26, 1917 and Dec. 31, 1918; record from Oct. 1, 1918 to Sept. 30, 1919.

Production: Milk, 11,821 lbs.; fat, 385.5 lbs.; test, 3.26 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,230; clover hay, 2,136; barley, oats, bran and oil meal, 1,888.

Rousseau, G. R., Bonduel

R. O. P. 438—Pearl: Gr. Holstein; 4 yrs.; fresh Feb. 1, 1918 and Jan. 8, 1919; record from Oct. 15, 1918 to Oct. 15, 1919.

Production: Milk, 11,436 lbs.; fat, 413.8 lbs.; test, 3.6 per cent.

Feed (lbs.): Pasture, 162 (days); silage, 8,265; straw, 500; oats, 3; barley, 1; oil meal, 1,953.

BUENA VISTA ASSOCIATION

Rust Brothers, Spring Green

R. O. P. 1043—Aaltje Salo Mechthilde Beets, 390,139: Reg. Holstein; 3 yrs.; fresh Aug. 25, 1919 and Sept. 24, 1920; record from March 3, 1920 to March 2, 1921.

Production: Milk, 11,785 lbs.; fat, 439.7 lbs.; test, 3.73 per cent.

Feed (lbs.): Silage, 13,333; alfalfa hay, 1,975; mixed feeds, 3,998.

Peck, Leon, Spring Green

R. O. P. 1044—Lora Bonheur Ormsby, 347,397: Reg. Holstein; 4 yrs.; fresh Dec. —, 1919 and Jan. 2, 1921; record from March 3, 1920 to March 2, 1921.

Production: Milk, 11,282 lbs.; fat, 381.7 lbs.; test, 3.38 per cent.

Feed (lbs.): Silage, 13,333; alfalfa hay, 1,975; beet pulp, 120; grain mixture, 3,451.

R. O. P. 1045—Cory Cornucopia Woodcrest, 244,174: Reg. Holstein; 6 yrs.; fresh April 2, 1920; record from March 3, 1920 to March 2, 1921.

Production: Milk, 11,514 lbs.; fat, 379.7 lbs.; test, 3.29 per cent.

Feeds (lbs.): Silage, 12,613; alfalfa hay, 2,065; grain mixture, 3,792; corn and cob meal, 310.

R. O. P. 1046—Cory Dutchland, 159,577: Reg. Holstein; 9 yrs.; fresh Feb. 16, 1920 and Jan. 6, 1921; record from March 3, 1920 to March 3, 1921.

Production: Milk, 11,307 lbs.; fat, 440.8 lbs.; test, 3.38 per cent.

Feed (lbs.): Silage, 13,333; hay, 1,975; grain mixture, 4,426; beet pulp, 120.

R. O. P. 1047—Cory Dutchland De Kol, ———: Reg. Holstein; 5 yrs.; fresh Nov. —, 1919 and Dec. 30, 1920; record from March 3, 1920 to March 2, 1921.

Production: Milk, 12,641 lbs.; fat, 458.3 lbs.; test, 3.62 per cent.

Feed (lbs.): Silage, 13,333; alfalfa hay, 1,975; grain mixture, 3,459.

R. O. P. 1048—Petrel Beechwood Piebe De Kol 2d, 124,390: Reg. Holstein; 9 yrs.; fresh Jan. 9, 1920 and Jan. 2, 1921; record from March 3, 1920 to March 2, 1921.

Production: Milk, 19,879 lbs.; fat, 427 lbs.; test, 2.14 per cent.

Feed (lbs.): Silage, 13,333; alfalfa hay, 1,975; grain mixture, 4,435; beet pulp, 120.

BURNETT COUNTY NO. 1 ASSOCIATION

Hanson Brothers, Grantsburg

R. O. P. 819—Ella: Gr. Guernsey; 8 yrs.; fresh Dec. 28, 1919 and Nov. 22, 1920; record from Feb. 1, 1920 to Jan. 31, 1921.

Production: Milk, 10,416 lbs.; fat, 462.3 lbs.; test, 4.44 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 4,820; mixed hay, 1,360; alfalfa hay, 1,155; bran, 968; corn, 388; barley, 670; cottonseed meal, 46; oil meal, 338; oats, 193.

Johnson, Emil, Grantsburg

R. O. P. 820—Sophie: Gr. Holstein; 5 yrs.; fresh Feb. 11, 1920 and Jan. 25, 1921; record from Feb. 1, 1920 to Jan. 31, 1921.

Production: Milk, 10,355 lbs.; fat, 420 lbs.; test, 4.06 per cent.

Feed (lbs.): Pasture, 157 (days); silage, 7,220; clover and alfalfa, 1,630; bran, 1,866; oats, 661; barley, 473; corn, 267; oil meal, 393.

Prichard, John, Grantsburg

R. O. P. 821—Fern Bell Tulip, 372,789: Reg. Jersey; 3 yrs.; fresh May 3, 1919 and May 26, 1920; record from Feb. 1, 1920 to Jan. 31, 1921.

Production: Milk, 7,259 lbs.; fat, 366.7 lbs.; test, 5.05 per cent.

Feed (lbs.): Pasture, 164 (days); silage, 3,800; mixed hay, 1,562; oats, 642; barley, 652; bran, 318; corn and cob meal, 210; oil meal, 16.

Reager, D. C., Grantsburg

R. O. P. 822—Jersey: Gr. Jersey; 8 yrs.; fresh Jan. 17, 1920; record from Feb. 1, 1920 to Jan. 31, 1921.

Production: Milk, 7,824 lbs.; fat, 373.6 lbs.; test, 4.77 per cent.

Feed (lbs.): Pasture, 157 (days); silage, 5,620; mixed hay, 1,940; bran, 949; oats, 576; oil meal, 241; hominy, 250.

West, Alfred, Grantsburg

R. O. P. 823—No. 6 June: Gr. Holstein; 5 yrs.; fresh Oct. 6, 1919 and Sept. 26, 1920; record from Feb. 1, 1920 to Jan. 30, 1921.

Production: Milk, 12,042 lbs.; fat, 411 lbs.; test, 3.41 per cent.

Feed (lbs.): Pasture, 178 (days); silage, 5,220; mixed hay, 1,040; straw, 600; oats, 845; barley, 960; bran, 568; cottonseed meal, 44; oil meal, 400.

BYRON ASSOCIATION

Cowles, E. M. & Sons, South Byron

R. O. P. 203a—Oakfield Lucyra Johanna, 256,078: Reg. Holstein; 6 yrs.; fresh Nov. 7, 1919 and Nov. 18, 1920; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 12,670 lbs.; fat, 485.7 lbs.; test, 3.83 per cent.

Feed (lbs.): Pasture, 214 (days); silage, 6,735; hay, 1,980; corn stalks, 290; Wisconsin balanced ration, 3,273.

R. O. P. 824—Jewel Rock De Kol Colantha 2d, 329,670: Reg. Holstein; 4 yrs.; fresh Dec. 26, 1919 and Nov. 26, 1920; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 12,162 lbs.; fat, 406.8 lbs.; test, 3.34 per cent.

Feed (lbs.): Pasture, 214 (days); silage, 6,735; hay, 1,980; corn stalks, 290; Wisconsin balanced ration, 2,960.

Galloway, E. A. and E. P., Fond du Lac

R. O. P. 905—Alice Lee 2d, 8,777: Reg. Brown Swiss; 3 yrs.; fresh Feb. 26, 1920; record from March 1, 1920 to Feb. 28, 1921.

Production: Milk, 9,648 lbs.; fat, 377 lbs.; test, 3.91 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 5,110; hay, 1,722; corn bundles, 155; grain, 1,807.

R. O. P. 906—Belle: Gr. Brown Swiss; 5 yrs.; fresh June 1, 1920 and Nov. 30, 1921; record from March 1, 1920 to Feb. 28, 1921.

Production: Milk, 10,384 lbs.; fat, 432.3 lbs.; test, 4.16 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 5,110; hay, 1,722; corn stalks, 1,551; grain, 1,838.

R. O. P. 907—Jeanette, 8,873: Reg. Brown Swiss; 3 yrs.; fresh Sept. 25, 1919 and Aug. 23, 1920; record from March 1, 1920 to Feb. 28, 1921.

Production: Milk, 9,560 lbs.; fat, 384.4 lbs.; test, 4.02 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 1,835; hay, 1,722; corn stalks, 155; grain, 2,667.

R. O. P. 908—Mabel: Gr. Brown Swiss; 3 yrs.; fresh Sept. 29, 1919 and Dec. 3, 1920; record from March 1, 1920 to Feb. 28, 1921.

Production: Milk, 10,200 lbs.; fat, 369.4 lbs.; test, 3.62 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 5,110; hay, 1,722; corn bundles, 155; grain, 1,794.

R. O. P. 909—Mona: Gr. Brown Swiss; 4 yrs.; fresh March 4, 1921 and Feb. 2, 1920; record from March 1, 1920 to Feb. 28, 1921.

Production: Milk, 9,794 lbs.; fat, 372.7 lbs.; test, 3.81 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 5,110; hay, 1,722; corn bundles, 155; grain, 1,380.

R. O. P. 910—Pretty Jane, 8,872: Reg. Brown Swiss; 3 yrs.; fresh Sept. 18, 1919 and Aug. 31, 1920; record from March 1, 1920 to Feb. 28, 1921.

Production: Milk, 8,940 lbs.; fat, 375.2 lbs.; test, 4.20 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 5,110; hay, 1,722; corn bundles, 155; grain, 2,128.

Rosenkranz, Escol, Brownsville

R. O. P. 970—A. M. 2d: Gr. Holstein; 6 yrs.; fresh Jan. 26, 1919 and March 10, 1920; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 10,791 lbs.; fat, 409.2 lbs.; test, 3.79 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 11,280; clover hay, 1,668; corn stalks, 232; grain, 1,270; oil meal, 30.

R. O. P. 971—Rosa: Gr. Holstein; 12 yrs.; fresh March 29, 1920; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 10,889 lbs.; fat, 373.2 lbs.; test, 3.42 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 11,280; clover hay, 1,668; corn stalks, 232; grain, 1,494; oil meal, 61.

R. O. P. 972—Roseland Aggie Grace, 262,094: Reg. Holstein; 6 yrs.; fresh Jan. 29, 1920 and Jan. 7, 1921; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 11,478 lbs.; fat, 411.5 lbs.; test, 3.59 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 11,280; clover hay, 1,568; corn stalks, 232; grain, 2,910; oil meal, 29.

R. O. P. 973—Roseland Pearl, 262,095: Reg. Holstein; 6 yrs.; fresh Jan. 1, 1920 and Dec. 26, 1920; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 10,951 lbs.; fat, 374.1 lbs.; test, 3.42 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 11,280; clover hay, 1,668; corn stalks, 232; grain, 2,054; oil meal, 29.

R. O. P. 974—Roselea Jewel Bertha, 319,012: Reg. Holstein; 4 yrs.; fresh Jan. 17, 1920 and Dec. 25, 1920; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 11,139 lbs.; fat, 377.5 lbs.; test, 3.39 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 11,280; hay, 1,668; corn stalks, 232; grain, 1,798; oil meal, 60.

R. O. P. 975—Victoria: Gr. Holstein; 6 yrs.; fresh Feb. 23, 1919 and March 29, 1920; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 11,524 lbs.; fat, 400.1 lbs.; test, 3.5 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 11,280; clover hay, 1,668; corn stalks, 232; grain, 1,478; oil meal, 30.

Schwefel, O. P., Oakfield

R. O. P. 825—Belle: Gr. Holstein; 7 yrs.; fresh Oct. 28, 1919 and Oct. 1, 1920; record from Feb. 1, 1920 to Jan. 31, 1921.

Production: Milk, 11,041 lbs.; fat, 372.5 lbs.; test, 3.37 per cent.

Feed (lbs.): Pasture, 198 (days); silage, 8,750; mixed hay, 664; alfalfa hay, 1,122; grain, 1,880; oil meal, 120.

R. O. P. 826—Minnie: Gr. Holstein; 8 yrs.; fresh ———; record from Feb. 1, 1920 to Jan. 31, 1921.

Production: Milk, 11,245 lbs.; fat, 424.8 lbs.; test, 3.78 per cent.

Feed (lbs.): Pasture, 198 (days); silage, 8,750; mixed hay, 664; alfalfa, 1,122; grain, 1,674; oil meal, 120.

R. O. P. 827—Pet: Gr. Holstein; 8 yrs.; fresh Dec. ———; record from Feb. 1, 1920 to Jan. 31, 1921.

Production: Milk, 13,427 lbs.; fat, 468.2 lbs.; test, 3.5 per cent.

Feed (lbs.): Pasture, 198 (days); silage, 8,750; mixed hay, 664; alfalfa hay, 1,122; grain, 2,216; oil meal, 120.

R. O. P. 828—Spott No. 8: Gr. Holstein; 9 yrs.; fresh March 10, 1920; record from Feb. 1, 1920 to Jan. 31, 1921.

Production: Milk, 11,086 lbs.; fat, 368.5 lbs.; test, 3.3 per cent.

Feed (lbs.): Pasture, 198 (days); silage, 8,730; mixed hay, 654; alfalfa, 822; grain, 1,765; oil meal, 30.

Stroup, Fred G., R. 5, Fond du Lac

R. O. P. 557—Brown: Gr. Guernsey; 10 yrs.; fresh Dec. 6, 1918 and Nov. 9, 1919; record from March 1, 1919 to March 1, 1920.

Production: Milk, 9,593 lbs.; fat, 374.1 lbs.; test, 3.89 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 7,030; hay, 885; corn bundles, 910; grain, 1,725.

R. O. P. 558—Edna: Gr. Guernsey; 5 yrs.; fresh March 3, 1919; record from March 1, 1919 to March 1, 1920.

Production: Milk, 9,015 lbs.; fat, 437.3 lbs.; test, 4.8 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 6,820; hay, 695; corn bundles, 620; grain, 1,132.

R. O. P. 559—Maloney: Gr. Guernsey; 6 yrs.; fresh April, 1918 and May 5, 1919; record from March 1, 1919 to March 1, 1920.

Production: Milk, 8,423 lbs.; fat, 368.3 lbs.; test, 4.4 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 4,840; hay, 455; corn bundles, 910; grain, 713.

R. O. P. 560—Old Yellow: Gr. Guernsey; 10 yrs.; fresh March 18, 1919 and Feb. 2, 1920; record from March 1, 1919 to March 1, 1920.

Production: Milk, 10,199 lbs.; fat, 391.9 lbs.; test, 3.84 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 7,030; hay, 885; corn bundles, 910; grain, 1,327.

R. O. P. 561—Spot: Gr. Guernsey; 9 yrs.; fresh Dec. 1918 and Oct. 1919; record from March 1, 1919 to March 1, 1920.

Production: Milk, 8,056 lbs.; fat, 369 lbs.; test, 4.58 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 7,030; hay, 885; corn bundles, 910; grain, 1,530.

CAMBRIDGE ASSOCIATION

Anderson, Nordahl I., Cambridge

R. O. P. 1145—No. 24: Gr. Guernsey; 9 yrs.; fresh May 7, 1919 and May 1, 1920; record from Aug. 1919 to Aug. 1920.

Production: Milk, 7,488 lbs.; fat, 378.3 lbs.; test, 5.05 per cent.

Feed (lbs.): Pasture, 188 (days); corn silage, 8,200; mixed hay, 1,040; grain, 1,110.

Saunders Brothers, Cambridge

R. O. P. 1146—Egdohl Girl: Gr. Holstein; 5 yrs.; fresh Nov. 5, 1918 and Sept. 1, 1919; record from Aug. 1919 to Aug. 1920.

Production: Milk, 12,200 lbs.; fat, 368.7 lbs.; test, 3.02 per cent.

Feed (lbs.): Pasture, 172 (days); corn silage, 9,900; mixed hay, 1,500; grain, 2,210; corn stover, 900.

R. O. P. 1147—Sadie Vale Madrigal II, 231,466: Reg. Holstein; 6 yrs.; fresh Nov. 14, 1918 and Oct. 14, 1919; record from Aug. 1919 to Aug. 1920.

Production: Milk, 12,629 lbs.; fat, 370.4 lbs.; test, 2.93 per cent.

Feed (lbs.): Pasture, 172 (days); corn silage, 9,900; mixed hay, 1,500; grain, 3,010; corn stover, 900.

CATARACT GUERNSEY ASSOCIATION

Dawley, Wesley, Cataract

R. O. P. 976—Ladysmith: Gr. Guernsey; 6 yrs.; fresh Nov. 4, 1920 and Dec. —, 1919; record from March 1, 1920 to March 1, 1921.

Production: Milk, 9,337 lbs.; fat, 426.8 lbs.; test, 4.57 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 5,430; hay, 1,293; corn fodder, 755; grain, 1,013; oil meal, 312; oats, 596; barley, 352.

R. O. P. 977—Queen: Gr. Jersey; 8 yrs.; fresh April 15, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 8,833 lbs.; fat, 409.4 lbs.; test, 4.63 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 5,430; hay, 1,293; corn fodder, 754; grain, 1,013; oil meal, 622; oats, 374; barley, 289.

Hanchett, W. H. and B. L., Sparta

R. O. P. 978—Fruit Farm Maid, 63,521: Reg. Guernsey; 4 yrs.; fresh Dec. 10, 1919 and Oct. 15, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 8,437 lbs.; fat, 392.6 lbs.; test, 4.65 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 7,890; alfalfa hay, 2,147; corn fodder, 450; oil meal, 157; bran, 420; oats, 40.

R. O. P. 979—Hambro's Queen, 79,684: Reg. Guernsey; 2 yrs.; fresh Aug. 27, 1919 and Sept. 25, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 7,424 lbs.; fat, 385.4 lbs.; test, 5.19 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 7,367; alfalfa hay, 2,147; corn fodder, 450; bran, 151; oats, 420; oil meal, 402.

R. O. P. 980—Jersey: Gr. Guernsey; 6 yrs.; fresh Nov. 25, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 10,456 lbs.; fat, 480.3 lbs.; test, 4.55 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 8,345; alfalfa, 2,147; corn fodder, 450; oil meal, 187; oats, 461; bran, 440.

R. O. P. 981—Uganda of Fruitfarm, 48,762: Reg. Guernsey; 6 yrs.; fresh Sept. 5, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 8,025 lbs.; fat, 388.3 lbs.; test, 4.84 per cent.

Feed (lbs.): Pasture, 92 (days); silage, 7,369; alfalfa hay, 2,147; corn fodder, 450; oil meal, 159; bran, 333; oats, 327.

Hansen, Carl F., Route 3, Sparta

R. O. P. 982—Hope of Valley View: Gr. Guernsey; 5 yrs.; fresh March 22, 1920 and Feb. 15, 1921; record from March 1, 1920 to March 1, 1921.

Production: Milk, 9,498 lbs.; fat, 517.2; test, 5.45 per cent.

Feed (lbs.): Pasture, 214 (days); silage, 4,760; hay, 848; corn fodder, 1,685; corn and cob meal, 327; oats, 592; bran, 934; barley, 256; oil meal, 181; corn, 151.

R. O. P. 983—Pet: Gr. Jersey; 9 yrs.; fresh March 31, 1919 and June 15, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 8,387 lbs.; fat, 399.5 lbs.; test, 4.76 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 4,760; hay, 848; corn fodder, 1,685; corn and cob meal, 249; oats, 644; bran, 857; barley, 256; corn, 152; oil meal, 181.

R. O. P. 984—Rose: Gr. Guernsey; 4 yrs.; fresh Sept. 29, 1919 and Sept. 21, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 6,154 lbs.; fat, 372.4 lbs.; test, 6.05 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 4,760; hay, 848; corn fodder, 1,685; corn and cob meal, 453; oats, 543; bran, 715; barley, 241; oil meal, 151.

Hansen, Norman J., Route 3, Sparta

R. O. P. 985—Reddy: Gr. Guernsey; 7 yrs.; fresh Nov. 5, 1920 and Jan. 1, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 7,596 lbs.; fat, 368.1 lbs.; test, 4.85 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 7,995; corn fodder, 1,380; oil meal, 144; grain, 1,899.

Johnson, Alfred, Cataract

R. O. P. 986—Rosy of Racheldale: Gr. Guernsey; 7 yrs.; fresh Nov. 10, 1919 and Oct. 15, 1920; record from March, 1920 to March, 1921.

Production: Milk, 8,597 lbs.; fat, 366.1 lbs.; test, 4.26 per cent.

Feed (lbs.): Pasture, 215 (days); silage, 4,013; hay, 492; fodder, 662; mangels, 300; grain, 782; oil meal, 88; barley, 286; oats, 337; straw, 695.

Luther, Fred W., Sparta

R. O. P. 987—Irene: Gr. Guernsey; 8 yrs.; fresh May 1, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 8,107 lbs.; fat, 371 lbs.; test, 4.58 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,356; oil meal, 198; hay, 1,328; grain mixture, 1,757.

R. O. P. 988—Pride: Gr. Guernsey; 6 yrs.; fresh Jan. 5, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 7,687 lbs.; fat, 377.5 lbs.; test, 4.91 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,358; hay, 1,328; grain mixture, 548; oil meal, 198; oats, 968; barley, 102; rye, 122.

Smith, Moses N., Cataract

R. O. P. 989—Elm Road Ida, 48,541: Reg. Guernsey; 6 yrs.; fresh Oct. 4, 1918 and Nov. 4, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 8,391 lbs.; fat, 422.9 lbs.; test, 5.04 per cent.

Feed (lbs.): Pasture, 154 (days); corn fodder, 506; silage, 9,330; bran, 230; oil meal, 477; oats, 150; barley, 299; corn, 181; mixed hay, 1,149.

CEDAR GROVE ASSOCIATION

DeBruine, Willis, Cedar Grove

R. O. P. 854—No. 2 Chloe: Gr. Holstein; 8 yrs.; fresh Feb. 25, 1919 and Feb. 3, 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 12,942 lbs.; fat, 449.2 lbs.; test, 3.47 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 8,372; hay, 1,801; oats, 900; bran, 1,193; gluten, 740; special, 237; cottonseed meal, 123; oil meal, 154; molasses, 165.

R. O. P. 855—No. 1 Johanna: Gr. Holstein; 7 yrs.; fresh Feb. 24, 1918 and Jan. 3, 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 12,947 lbs.; fat, 448 lbs.; test, 3.46 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 8,682; hay, 1,801; oats, 1,023; bran, 1,356; gluten, 704; special, 257; cottonseed meal, 128; oil meal, 159; Molasses, 165.

R. O. P. 856—No. 5 Maid: Gr. Holstein; 6 yrs.; fresh Nov. 9, 1918 and Nov. 11, 1919; record from July 1, 1919 to July 1, 1920.

Production: Milk, 12,635 lbs.; fat, 466.1 lbs.; test, 3.69 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 8,682; hay, 1,956; oats, 1,170; bran, 1,293; gluten, 812; special, 187; cottonseed meal, 128; oil meal, 190; molasses, 227.

DeBruine, William, Cedar Grove

R. O. P. 851—Anna: Gr. Holstein; 6 yrs.; fresh Sept. 18, 1918 and Sept. 16, 1919; record from July 1, 1919 to July 1, 1920.

Production: Milk, 10,984 lbs.; fat, 383.3 lbs.; test, 3.49 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 8,084; hay, 951; oats, 906; special, 634; gluten, 822; bran, 630; oil meal, 222; molasses, 29.

R. O. P. 852—Elsie: Gr. Holstein; fresh Nov. 18, 1918 and Oct. 27, 1919; record from July 1, 1919 to July 1, 1920.

Production: Milk, 9,528 lbs.; fat, 370.5 lbs.; test, 3.89 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 8,964; hay, 951; oats, 870; special, 543; gluten, 646; bran, 547; oil meal, 222; molasses, 29.

R. O. P. 853—May: Gr. Holstein; 6 yrs.; fresh Feb. 1, 1919 and Feb. 14, 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 10,270 lbs.; fat, 371.1 lbs.; test, 3.62 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 8,964; hay, 362; oats, 923; special, 361; cottonseed meal, 188; gluten, 334; bran, 432; oil meal, 175; molasses, 29.

DeMaster, John, Cedar Grove

R. O. P. 857—Bess of De Master Farm, 44,626: Reg. Ayrshire; 4 yrs.; fresh April 15, 1919 and April 23, 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 10,083 lbs.; fat, 414.6 lbs.; test, 4.11 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 9,946; hay, 1,706; barley, 435; oats, 715; gluten, 129; bran, 510; special, 112; oil meal, 240.

Dutch Canning Company, Cedar Grove

R. O. P. 847—Beauty: Gr. Holstein; 3 yrs.; fresh May 1, 1919 and March 21, 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 12,433 lbs.; fat, 382.3 lbs.; test, 3.07 per cent.

Feed (lbs.): Pasture, 164 (days); silage, 10,238; hay, 544; gluten, 1,351; special, 838; oats, 315; oil meal and cottonseed meal, 331; bran, 514; barley and corn meal, 220; molasses, 84.

R. O. P. 848—Nancy: Gr. Holstein; 3 yrs.; fresh Feb. 1, 1919 and Jan. 28, 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 13,059 lbs.; fat, 509.0 lbs.; test, 3.89 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 10,230; hay, 544; gluten, 1,276; special, 724; oats, 396; oil and cottonseed meal, 378; bran, 537; barley and corn meal, 263; molasses, 84.

R. O. P. 849—Peggie: Gr. Holstein; 8 yrs.; fresh April 15, 1919 and March 12, 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 12,866 lbs.; fat, 427.5 lbs.; test, 3.32 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 10,230; hay, 544; gluten, 1,304; special, 872; oats, 275; oil and cottonseed meal, 268; bran, 424; barley and corn meal, 160; molasses, 84.

R. O. P. 850—Rose: Native; 7 yrs.; fresh March 26, 1919 and April 15, 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 11,292 lbs.; fat, 404.6 lbs.; test, 3.58 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 10,230; hay, 544; gluten, 1,174; special, 760; oats, 314; oil and cottonseed meal, 208; bran, 356; barley and corn meal, 80; molasses, 77.

Du Mez, John, Cedar Grove

R. O. P. 858—Hannah: Gr. Holstein; 7 yrs.; fresh Dec. 15, 1918 and Nov. 14, 1919; record from July 1, 1919 to July 1, 1920.

Production: Milk, 10,341 lbs.; fat, 400.1 lbs.; test, 3.87 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 10,254; hay, 974; bran, 803; gluten, 1,080; oats, 725; special, 402; corn meal, 345; cottonseed meal, 102; oil meal, 61.

R. O. P. 859—Niger: Gr. Holstein; 4 yrs.; fresh Feb. 25, 1919, and Jan. 14, 1920; record from July 1, 1919, to July 1, 1920.

Production: Milk, 9,649 lbs.; fat, 375.1 lbs.; test, 3.89 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 1,025; hay, 974; bran, 758; gluten, 945; oats, 610; special, 402; corn meal, 231; cottonseed meal, 64; oil meal, 164; molasses, 99.

R. O. P. 860—Star: Gr. Holstein; 8 yrs.; fresh, —————; record from July 1, 1919, to July 1, 1920.

Production: Milk, 10,859 lbs.; fat, 417.7 lbs.; test, 3.84 per cent.

Feed (lbs.): Pasture, 123 (days); silage, 10,254; hay, 974; bran, 844; gluten, 1,090; oats, 725; special, 402; corn meal, 345; cottonseed meal, 164; oil meal, 133.

Huenink, Garrett C., Cedar Grove

R. O. P. 861—Minita Howtje Walton Colantha, 436,587: Reg. Holstein; 2 yrs.; fresh Sept. 20, 1920; record from July 1, 1919, to July 1, 1920.

Production: Milk, 10,444 lbs.; fat, 402.5 lbs.; test, 3.85 per cent.

Feed (lbs.): Pasture, 121 (days); silage, 8,260; hay, 827; special dairy feed, 578; molasses, 93; bran, 1,158; oil meal, 260; gluten, 824; cottonseed meal, 229; beet pulp, 141.

R. O. P. 862—Queen Salo Johanna De Kol, 436,582: Reg. Holstein; 2 yrs.; fresh Nov. 15, 1920; record from July 1, 1919, to July 1, 1920.

Production: Milk, 9,773 lbs.; fat, 381.1 lbs.; test, 3.90 per cent.

Feed (lbs.): Pasture 60 (days); silage, 6,895; hay, 887; special, 330; bran, 944; oil meal, 198; gluten, 824; oats, 824; cottonseed meal, 229; beet pulp, 180.

Huenink and Lubach, Cedar Grove

R. O. P. 223b—Pietertje Maid Aaggie Johanna, 95,532: Reg. Holstein; 12 yrs.; fresh March 12, 1919, and April 3, 1920; record from July 1, 1919, to July 1, 1920.

Production: Milk, 17,846 lbs.; fat, 595.4 lbs.; test, 3.34 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 8,945; hay, 4,525; bran, 1,453; Schumacher, 631; oats, 1,416; oil meal, 921; cottonseed meal, 697; gluten, 697; brewer's grains 792; beet pulp and molasses, 247.

R. O. P. 229b—Pauline: Gr. Holstein; 6 yrs.; fresh Nov. 23, 1918, and Nov. 14, 1919; record from July 1, 1919, to July 1, 1920.

Production: Milk, 17,362 lbs.; fat, 637.4 lbs.; test, 3.67 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 8,945; hay, 3,480; bran, 1,312; Schumacher, 524; oats, 991; oil meal, 495; cottonseed and barley meal, 204; gluten, 773; brewer's grains, 438; beet pulp and molasses, 439.

R. O. P. 230b—Aggie: Gr. Holstein; 6 yrs.; fresh Oct. 17, 1918, and Feb. 23, 1919; record from July 1, 1919, to July 1, 1920.

Production: Milk, 16,742 lbs.; fat, 689.2 lbs.; test, 4.11 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 8,945; hay, 4,090; bran, 1,424; Schumacher feed, corn meal and hominy, 635; oats, 1,132; oil meal, 633; cottonseed meal and barley, 280; gluten, 795; brewer's grains, 921; beet pulp and molasses, 416.

R. O. P. 357a—Pietertje Maid Pontiac Johanna, 352,389: Reg. Holstein; 3 yrs.; fresh March 8, 1919, and April 30, 1920; record from July 1, 1919, to July 1, 1920.

Production: Milk, 14,840 lbs.; fat, 523.9 lbs.; test, 3.53 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 8,945; hay, 4,525; bran, 1,339; Schumacher, 584; oats, 1,165; oil meal, 652; cottonseed meal and barley, 179; gluten, 699; brewer's grains, 732; beet pulp and molasses, 380.

R. O. P. 359a—Klazerina Boelyn 3d, 333,132: Reg. Holstein; 3 yrs.; fresh April 18, 1918, and July 23, 1919; record from July 1, 1919, to July 1, 1920.

Production: Milk, 18,150 lbs.; fat, 656.9 lbs.; test, 3.57 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 9,295; hay, 4,383; bran, 1,675; Schumacher, 175; oats, 1,381; gluten, 862; oil meal, 693; cottonseed meal, 328; brewer's grains and hominy, 547; beet pulp and molasses, 287.

R. O. P. 360a—Princess Colantha Piebe, 230,595: Reg. Holstein; 6 yrs.; fresh March 16, 1919; record from July 1, 1919, to July 1, 1920.

Production: Milk, 14,674 lbs.; fat, 533.0; test, 3.63 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 8,945; hay, 4,533; bran, 5,961; Schumacher, 309; oats, 1,144; oil meal, 596; cottonseed and barley, 218; gluten, 868; brewer's grains, 1,640; beet pulp and molasses, 398.

R. O. P. 863—Belle Pauline De Kol 5th, 404,600: Reg. Holstein; 2 yrs.; fresh Sept. 19, 1919; record from July 1, 1919, to July 1, 1920.

Production: Milk, 11,303 lbs.; fat, 390.6 lbs.; test, 3.46 per cent.

Feed (lbs.): Pasture, 60 (days); silage, 7,397; hay, 3,990; bran, 1,160; oats, 883; oil meal, 475; cottonseed and corn meal, 383; gluten, 437; hominy, 188; molasses, 121; brewers' grains, 225.

R. O. P. 864—Caroline Hengerveld Piebe 3d, 354,385: Reg. Holstein; 5 yrs.; fresh May 2, 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 12,150 lbs.; fat, 427.2 lbs.; test, 3.5 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 8,945; hay, 4,383; bran, 1,248; Schumacher, 232; oats, 1,006; oil meal, 515; cottonseed meal and barley, 174; brewers' grains, 744; gluten, 711; beet pulp and molasses, 1,150.

R. O. P. 865—Caroline Johanna Hengerveld Piebe, 355,838: Reg. Holstein; 3 yrs.; fresh April, 1918 and July 2, 1919; record from July 1, 1919 to July 1, 1920.

Production: Milk, 19,317 lbs.; fat, 616.3 lbs.; test, 3.19 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 8,945; hay, 4,631; bran, 1,600; Schumacher, 552; oats, 1,274; oil meal, 645; cottonseed meal, 441; gluten, 857; brewers' grains, 788; beet pulp and molasses, 439.

Kolste, Art, Cedar Grove

R. O. P. 332a—Lady: Gr. Holstein; 3 yrs.; fresh Nov. 17, 1918 and Nov. 20, 1919; record from July 1, 1919 to July 1, 1920.

Production: Milk, 12,628 lbs.; fat, 463.2 lbs.; test, 3.67 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 12,247; hay, 1,440; gluten, 983; special, 874; oil meal, 136; oats, 183; corn and cottonseed meal, 365; bran, 844.

R. O. P. 866—Mollie: Gr. Holstein; 6 yrs.; fresh March 10, 1919 and March 7, 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 10,667 lbs.; fat, 369 lbs.; test, 3.46 per cent.

Feed (lbs.): Pasture, 154 (days); silage, 11,047; hay, 1,440; gluten, 1,102; special, 1,023; bran, 721; oil meal, 100; oats, 78; corn and cottonseed meal, 317; beet pulp, 31.

R. O. P. 867—Peggy: Gr. Holstein; 4 yrs.; fresh Jan. 26, 1919 and Dec. 28, 1919; record from July 1, 1919 to July 1, 1920.

Production: Milk, 9,508 lbs.; fat, 381.8 lbs.; test, 4.02 per cent.

Feed (lbs.): Pasture, 156 (days); silage, 12,247; hay, 1,460; gluten, 1,010; special, 1,030; bran, 793; oil meal, 120; oats, 183; corn and cottonseed meal, 331; beet pulp, 31.

Meeusen, Martin, Cedar Grove

R. O. P. 868—Johanna: Gr. Holstein; 5 yrs.; fresh Feb. 27, 1919 and March 14, 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 10,612 lbs.; fat, 376 lbs.; test, 3.54 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 9,670; hay, 850; oats, 606; cottonseed meal, barley and corn meal, 514; gluten, 196; bran, 710; oil meal, 858; beet pulp, 150.

R. O. P. 869—Nora: Gr. Holstein; 7 yrs.; fresh May 1, 1919; record from July 1, 1919 to July 1, 1920.

Production: Milk, 10,393 lbs.; fat, 395.7 lbs.; test, 3.81 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 9,670; hay, 850; oats, 611; cottonseed meal, 538; barley and corn meal, 196; gluten, 752; bran, 861; oil meal, 164; molasses, 128.

R. O. P. 870—Star: Gr. Holstein; 8 yrs.; fresh April 1, 1919 and March 7, 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 9,122 lbs.; fat, 366.6 lbs.; test, 4.02 per cent.

Feed (lbs.): Pasture, 182 (days); silage, 9,670; hay, 850; oats, 534; cottonseed meal, 438; barley and corn meal, 196; gluten, 644; bran, 717; oil meal, 113; molasses, 128.

R. O. P. 871—Truda: Gr. Holstein; 5 yrs.; fresh Dec. 25, 1918 and Jan. 27, 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 9,733 lbs.; fat, 368.3 lbs.; test, 3.79 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 9,783; hay, 850; oats, 564; special and cottonseed meal, 441; barley and corn meal, 184; gluten, 696; bran, 862; oil meal, 147; molasses, 128.

Navis, Henry, Cedar Grove

R. O. P. 872—Carrie: Gr. Holstein; 7 yrs.; fresh Feb. 17, 1919 and Jan. 25, 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 11,298 lbs.; fat, 395.3 lbs.; test, 3.49 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 9,181; hay, 1,818; oats, 1,051; molasses, 357; barley and corn meal, 391; bran and cottonseed meal, 475; special and oil meal, 118; beans, 607; gluten, 906.

R. O. P. 873—Cora: Gr. Holstein; 6 yrs.; fresh Dec. 28, 1919; record from July 1, 1919 to July 1, 1920.

Production: Milk, 10,024 lbs.; fat, 390.5 lbs.; test, 3.90 per cent.

Feed (lbs.): Pasture, 30 (days); silage, 5,944; hay, 1,632; oats, 585; molasses, 456; gluten, 876; barley, 346; bran, 622; special and oil meal, 157; beans, 607.

R. O. P. 874—Rose: Native; 11 yrs.; fresh June 12, 1919 and June 9 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 12,818 lbs.; fat, 454.7 lbs.; test, 3.55 per cent.

Feed (lbs.): Pasture, (days); silage, 8,146; hay, 1,818; oats, 1,336; molasses, 363; gluten, 1,473; barley and cottonseed meal, 643; bran, 522; special, 279; beans, 731.

R. O. P. 875—Spot: Gr. Holstein; 7 yrs.; fresh March 1, 1919 and March 5, 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 10,468 lbs.; fat, 373.7 lbs.; test, 3.57 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 9,181; hay, 1,818; oats, 909; molasses, 276; gluten, 968; barley and C. D. F., 435; bran, 452; special and oil meal, 118; beans, 644.

Van Driest, Mrs. and Sons, Cedar Grove

R. O. P. 339a—Star: Gr. Holstein; 5 yrs.; fresh April 10, 1919 and March 21, 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 17,409 lbs.; fat, 618.5 lbs.; test, 3.55 per cent.

Feed (lbs.): Silage, 10,089; hay, 3,666; gluten, 1,754; oats, 1,479; oil meal, 325; bran, 549; corn meal, 681; molasses, 185; cottonseed meal, 227.

R. O. P. 343a—Seven: Gr. Holstein; 7 yrs.; fresh Dec. 18, 1918 and Dec. 20, 1919; record from July 1, 1919 to July 1, 1920.

Production: Milk, 14,173 lbs.; fat, 524.7 lbs.; test, 3.7 per cent.

Feed (lbs.): Silage, 10,089; hay, 3,666; gluten, 1,309; oats, 1,089; oil meal, 299; bran, 886; corn meal, 597; molasses, 229; cottonseed meal, 231.

R. O. P. 876—Alicc: Gr. Holstein; 2 yrs.; fresh Aug. 12, 1919; record from July 1, 1919 to July 1, 1920.

Production: Milk, 15,041 lbs.; fat, 544 lbs.; test, 3.62 per cent.

Feed (lbs.): Silage, 9,399; hay, 3,749; gluten, 1,458; oats, 1,188; oil meal, 393; bran, 960; corn meal, 626; molasses, 189; cottonseed meal, 164.

R. O. P. 877—Isabelle: Gr. Holstein; 3 yrs.; fresh March 2, 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 12,582 lbs.; fat, 438.9 lbs.; test, 3.48 per cent.

Feed (lbs.): Silage, 10,089; hay, 3,666; gluten, 1,322; oats, 1,114; oil meal, 315; bran, 693; corn meal, 482; molasses, 92; cottonseed meal, 199.

R. O. P. 878—Sussie: Gr. Holstein; 4 yrs.; fresh Dec., 1918 and Dec. 6, 1919; record from July 1, 1919 to July 1, 1920.

Production: Milk, 10,583 lbs.; fat, 431.1 lbs.; test, 4.07 per cent.

Feed (lbs.): Silage, 10,124; hay, 3,666; gluten, 1,049; oats, 901; oil meal, 250; bran, 785; Corn meal, 502; Molasses, 189; cottonseed meal, 196.

Veldboom, Alvin, Cedar Grove

R. O. P. 879—Lateon: Gr. Holstein; 8 yrs.; fresh Feb. 29, 1919 and Jan. 26, 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 10,430 lbs.; fat, 370.2 lbs.; test, 3.55 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 12,719; hay, 720; gluten, 1,046; corn meal, 159; bran, 524; oil meal, 143; oats, 322; cottonseed meal, 240.

R. O. P. 880—Wafford: Gr. Holstein; 7 yrs.; fresh Nov. 18, 1918 and Nov. 5, 1919; record from July 1, 1919 to July 1, 1920.

Production: Milk, 10,079 lbs.; fat, 375.1 lbs.; test, 3.72 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 12,874; hay, 947; gluten, 1,236; special and C. S. meal, 159; bran, 743; oil meal, 164; oats, 322; cottonseed meal, 240.

Wissink, Benjamin, Cedar Grove

R. O. P. 881—Snow Ball: Gr. Holstein, 3 yrs.; fresh Aug. 11, 1918 and Jan. 2, 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 10,647 lbs.; fat, 408.1 lbs.; test, 3.74 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 9,639; hay, 970; gluten, 509; oats, 492; special and molasses, 418; bran, 500; oil meal, 206; barley and beans, 480; corn meal, 165; cottonseed meal, 226.

CLEAR LAKE ASSOCIATION

Stewart, E. T., Clear Lake

R. O. P. 473—Yeksa of Lousdale, 54,775: Reg. Guernsey; 4 yrs.; fresh Nov. 4, 1917 and Dec. 7, 1918; record from Dec. 21, 1918 to Nov. 21, 1919.

Production: Milk, 9,647 lbs.; fat, 437.4 lbs.; test, 4.53 per cent.

Feed (lbs.): Pasture, 167 (days); silage, 6,447; hay, 2,326; grain, 257; bran, 969; oats, 1,379; oil meal, 160; pea silage, 840.

Stewart, T. R., Clear Lake

R. O. P. 478—Annie Laurie of Burn Brae, 43,082: Reg. Guernsey; 5 yrs.; fresh May 12, 1918 and April 21, 1919; record from Dec. 24, 1918 to Dec. 24, 1919.

Production: Milk, 6,839 lbs.; fat, 392.7; test, 5.74 per cent.

Feed (lbs.): Silage, 5,804; alfalfa hay, 871; millet hay, 511; barley, 168; bran, 374; oats, 1,393; oil meal, 69; clover, 480; corn on stalk, 1,375.

DARIEN ASSOCIATION

Hibbard, A. G., Darien

R. O. P. 807—Best: Gr. Holstein; 5 yrs.; fresh Nov. 7, 1919; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 12,721 lbs.; fat, 474.6 lbs.; test, 3.73 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 8,196; hay, 1,482; corn fodder, 820; Schumacher feed, 90.

R. O. P. 808—Black Face Bess: Gr. Holstein; 5 yrs.; fresh Sept. 2, 1919 and Sept. 20, 1920; record from Feb. 1, 1920 to Jan. 31, 1921.

Production: Milk, 10,434 lbs.; fat, 375.4 lbs.; test, 3.6 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 7,532; hay, 1,482; corn fodder, 820; grain, 2,714.

R. O. P. 809—Susie: Gr. Holstein; 6 yrs.; fresh Nov. 27, 1919 and Oct. 20, 1920; record from Feb. 1, 1920 to Jan. 31, 1921.

Production: Milk, 10,669 lbs.; fat, 433.7 lbs.; test, 4.07 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 8,134; hay, 1,482; corn fodder, 820; grain, 3,003; oil meal, 135; Schumacher, 90.

Peters, E. A. & Sons, Sharon

R. O. P. 801—Duchess De Kol Belmont, 323,726: Reg. Holstein; 6 yrs.; fresh Dec. 20, 1919 and Nov. 11, 1920; record from Feb. 1, 1920 to Jan. 31, 1921.

Production: Milk, 10,785 lbs.; fat, 380.6 lbs.; test, 3.52 per cent.

Feed (lbs.): Pasture, 169 (days); silage, 6,541; hay, 1,391; corn stover, 951; grain, 3,319; oil meal, 29.

Zahm, E. R., Darien

R. O. P. 761—Ada: Gr. Shorthorn; 6 yrs.; fresh Nov. 20, 1919 and Oct. 26, 1920; record from Feb. 1, 1920 to Jan. 31, 1921.

Production: Milk, 7,914 lbs.; fat, 384.9 lbs.; test, 4.86 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 5,597; hay, 1,884; corn stalks, 1,703; bran, 294; grain, 1,586; bran, oats, barley and oil meal, 1,095; oats, barley, bran, oil meal and corn meal, 1,500.

R. O. P. 762—Edna: Gr. Shorthorn; 4 yrs.; fresh Nov. 6, 1919 and Oct. 19, 1920; record from Feb. 1, 1920 to Jan. 31, 1921.

Production: Milk, 10,122 lbs.; fat, 396.8 lbs.; test, 3.92 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 5,597; hay, 1,884; corn stalks, 1,603; bran, 294; grain, 1,676; bran, oats, barley and oil meal, 1,095; oats, barley, bran, oil meal and corn meal, 1,500.

DODGEVILLE ASSOCIATION

Berryman, Edward & Sons, Dodgeville

R. O. P. 990—Francis: Gr. Jersey; 9 yrs.; fresh Jan. 29, 1919 and March 15, 1920; record from April 27, 1920 to April 27, 1921.

Production: Milk, 8,453 lbs.; fat, 388.4 lbs.; test, 4.59 per cent.

Feed (lbs.): Silage, 3,312; hay, 1,580; grain, 962.

R. O. P. 991—Hazel: Gr. Jersey; 7 yrs.; fresh Dec. 20, 1919 and Nov. 12, 1920; record from April 28, 1920 to April 28, 1921.

Production: Milk, 7,160 lbs.; fat, 365.4 lbs.; test, 5.10 per cent.

Feed (lbs.): Silage, 3,312; hay, 1,680; grain, 1,322.

Linden, Chas., Dodgeville

R. O. P. 992—Maggie De Kol Alban Dun, 157,927: Reg. Holstein; 9 yrs.; fresh March 21, 1919 and March 20, 1920; record from April 17, 1920 to April 17, 1921.

Production: Milk, 10,809 lbs.; fat, 385.6 lbs.; test, 3.57 per cent.

Feed (lbs.): Silage, 4,420; hay, 2,590; grain, 1,303.

Murrish, Edwin, Dodgeville

R. O. P. 993—Flossie: Gr. Guernsey; 4 yrs.; fresh Oct. 5, 1919 and Oct. 16, 1920; record from April 29, 1920 to April 29, 1921.

Production: Milk, 5,850 lbs.; fat, 372.1 lbs.; test, 6.36 per cent.

Feed (lbs.): Pasture, 199 (days); silage, 4,280; hay, 2,250; grain, 1,786.

R. O. P. 994—Francis: Gr. Guernsey; — yrs.; fresh Feb. 8, 1919 and April 18, 1920; record from April 29, 1920 to April 29, 1921.

Production: Milk, 6,980 lbs.; fat, 369.9 lbs.; test, 5.30 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 4,880; hay, 2,250; grain, 1,085.

Penberthy, Ernest, Dodgeville

R. O. P. 555—Jennie: Gr. Holstein; 5 yrs.; fresh May 29, 1919 and —; record from March 27, 1919 to March 27, 1920.

Production: Milk, 10,451 lbs.; fat, 376.37 lbs.; test, 3.60 per cent.

Feed (lbs.): Corn fodder, 806; mixed hay, 2,506; concentrate mixture, 1,934.

R. O. P. 556—Susie: Gr. Holstein; 7 yrs.; fresh March 9, 1919; record from March 27, 1919 to March 27, 1920.

Production: Milk, 9,580 lbs.; fat, 405.60 lbs.; test, 4.23 per cent.

Feed (lbs.): Pasture, 183 (days); corn fodder, 806; mixed hay, 2,754; grain, 2,236.

Philipps, Frank, Dodgeville

R. O. P. 995—Alice: Gr. Guernsey; — yrs.; fresh May 16, 1920; record from April 5, 1920 to April 5, 1921.

Production: Milk, 10,206 lbs.; fat, 443.6 lbs.; test, 4.35 per cent.

Feed (lbs.): Pasture, 214 (days); silage, 4,920; hay, 1,050; grain, 2,411.

R. O. P. 996—Christy: Gr. Guernsey; 5 yrs.; fresh March 24, 1920; record from April 5, 1920 to April 5, 1921.

Production: Milk, 8,078 lbs.; fat, 390.1 lbs.; test, 4.83 per cent.

Feed (lbs.): Pasture, 224 (days); silage, 4,314; hay, 1,450; grain, 2,558.

R. O. P. 997—Diamond: Gr. Guernsey; 6 yrs.; fresh March 18, 1920; record from April 5, 1920 to April 5, 1921.

Production: Milk, 9,339 lbs.; fat, 398.4 lbs.; test, 4.27 per cent.

Feed (lbs.): Pasture, 223 (days); silage, 4,674; hay, 1,050; grain, 2,711.

R. O. P. 998—Nelly: Gr. Guernsey; 7 yrs.; fresh March 5, 1920; aborted January, 1921; record from April 15, 1920 to April 15, 1921.

Production: Milk, 9,792 lbs.; fat, 414.3 lbs.; test, 4.23 per cent.

Feed (lbs.): Pasture, 224 (days); silage, 4,920; hay, 1,450; grain, 2,711.

Thomas, Roy J., Dodgeville

R. O. P. 999—Mousie of Green River, 235,456: Reg. Jersey; 11 yrs.; fresh Feb. 4, 1920; record from April 27, 1920 to April 27, 1921.

Production: Milk, 8,385 lbs.; fat, 477.5 lbs.; test, 5.69 per cent.

Feed (lbs.): Pasture, 214 (days); silage, 4,449; hay, 1,500; grain, 1,824.

R. O. P. 1000—Pedro King's Blue Belle, 349,554: Reg. Jersey; 6 yrs.; fresh Feb. 12, 1920 and Feb. 16, 1921; record from April 27, 1920 to April 27, 1921.

Production: Milk, 6,692 lbs.; fat, 402.8 lbs.; test, 6.02 per cent.

Feed (lbs.): Pasture, 214 (days); silage, 4,464; hay, 1,440; grain, 1,732.

R. O. P. 1001—Rambler's Sylvia, 438,308: Reg. Jersey; 3 yrs.; fresh April 2, 1920 and Jan. 18, 1921; record from April 27, 1920 to April 27, 1921.

Production: Milk, 6,969 lbs.; fat, 397.9 lbs.; test, 5.71 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 4,464; hay, 1,200; grain, 1,713.

R. O. P. 1002—Stubley's Double Time, 358,710: Reg. Jersey; 6 yrs.; fresh Sept. 22, 1919 and Sept. 21, 1920; record from April 27, 1920 to April 27, 1921.

Production: Milk, 9,092 lbs.; fat, 389.4 lbs.; test, 4.28 per cent.

Feed (lbs.): Pasture, 214 (days); silage, 4,812; hay, 1,500; grain, 2,427.

R. O. P. 1003—Winnie Rose, 318,871: Reg. Jersey; 7 yrs.; fresh May 16, 1920 and April 6, 1921; record from April 27, 1920 to April 27, 1921.

Production: Milk, 7,401 lbs.; fat, 407.3 lbs.; test, 5.5 per cent.

Feed (lbs.): Pasture, 214 (days); silage, 4,064; hay, 1,500; grain, 1,522.

Weier, Robert P., Dodgeville

R. O. P. 1004—Dell: Gr. Holstein; 8 yrs.; fresh March 3, 1920 and Jan. 14, 1921; record from April 20, 1920 to April 20, 1921.

Production: Milk, 13,536 lbs.; fat, 440.7 lbs.; test, 3.26 per cent.

Feed (lbs.): Pasture, 205 (days); silage, 2,315; hay, 2,185; grain, 2,061.

Wilson, E. J., Dodgeville

R. O. P. 1005—One-Eye: Gr. Holstein; 3 yrs.; fresh April 19, 1920 and June 1, 1919; record from April 23, 1920 to April 23, 1921.

Production: Milk, 9,558 lbs.; fat, 434.7 lbs.; test, 4.55 per cent.

Feed (lbs.): Pasture, 85 (days); silage, 12,050; hay, 2,580; grain, 3,063; straw, 1,160; ear corn, 323.

R. O. P. 1006—Skinny: Gr. Jersey; 10 yrs.; fresh March 1, 1920; record from April 23, 1920 to April 23, 1921.

Production: Milk, 8,574 lbs.; fat, 381.4 lbs.; test, 4.45 per cent.

Feed (lbs.): Pasture, 85 (days); silage, 11,600; hay, 1,080; grain, 234; straw, 1,080; ear corn, 234.

R. O. P. 1007—Whiteface: Gr. Holstein; 3 yrs.; fresh April 1, 1919 and April, 1920; record from April 23, 1920 to April 23, 1921.

Production: Milk, 11,915 lbs.; fat, 427.2 lbs.; test, 3.58 per cent.

Feed (lbs.): Pasture, 85 (days); silage, 11,600; hay, 2,580; grain, 3,153; ear corn, 323; stover, 1,160.

DORCHESTER ASSOCIATION

Boxrucker, Jake, Dorchester

R. O. P. 456—Queen: Gr. Holstein; 9 yrs.; fresh Nov. 4, 1918; record from Jan. 15, 1919 to Jan. 1, 1920.

Production: Milk, 9,554 lbs.; fat, 366.4 lbs.; test, 3.83 per cent.

Feed (lbs.): Pasture, 173 (days); hay, 3,893; oats, 771; gluten feed, 225; wheat bran, 379.

R. O. P. 457—Daisy: Gr. Holstein; 7 yrs.; fresh Dec. 3, 1918 and Nov. 4, 1919; record from Jan. 1, 1919 to Jan. 1, 1920.

Production: Milk, 9,556 lbs.; fat, 365.2 lbs.; test, 3.82 per cent.

Feed (lbs.): Pasture, 157 (days); hay, 4,140; oats, 812; gluten feed, 458; wheat bran, 467; oil meal, 68; barley, 37; rye, 37.

Kingsley, George, Dorchester

R. O. P. 458—Belle: Gr. Holstein; 8 yrs.; fresh Oct. 2, 1919; record from Dec. 17, 1918 to Dec. 17, 1919.

Production: Milk, 9,492 lbs.; fat, 378.3 lbs.; test, 3.98 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,770; hay, 2,587; gluten, 901; bran, 598; ground flaxseed, 124; roots, 1,150.

DUNN COUNTY NO. 1 ASSOCIATION

Kent Brothers, Rusk

R. O. P. 634—Sally: Gr. Guernsey; 5 yrs.; fresh Jan. 1, 1919; record from April 1, 1919 to March 31, 1920.

Production: Milk, 6,979 lbs.; fat, 407.9 lbs.; test, 5.8 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 10,064; hay, 1,444; corn, 226; oats, 931; oil meal, 331; cottonseed meal, 360; bran, 503.

Vandre, George, Menomonie

R. O. P. 1173—Bessie of Oaklawn Farm: Gr. Guernsey; 10 yrs.; fresh Nov. 22, 1920; record from May 6, 1920 to May 6, 1921.

Production: Milk, 15,440 lbs.; fat, 726.2 lbs.; test, 4.7 per cent.

Feed (lbs.): Pasture, 152 (days); silage, 4,020; hay, 2,250; oats, 470; bran, 20; oil meal, 224; mixed feed, 1,495.

DUNN COUNTY NO. 2 ASSOCIATION

Bible, C. E., Downing

R. O. P. 568—Brownie No. 6: Gr. Jersey; 7 yrs.; fresh February, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 8,607 lbs.; fat, 389.5 lbs.; test, 6.1 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 2,449; hay, 1,395; grain, 688.

Gillis, Aug., Glenwood City

R. O. P. 569—Hattie: Gr. Holstein; 9 yrs.; fresh Feb. 13, 1919; record from Jan. 1, 1919 to Jan. 1, 1920.

Production: Milk, 13,094 lbs.; fat, 504.8 lbs.; test, 3.9 per cent.

Feed (lbs.): Pasture, 184 (days); hay, 1,500; silage, 6,025; beets, 948; corn feed, 475; oats and bran, 1,555; dairy feed, 232; corn fodder, 732; oil meal, 62.

R. O. P. 570—Star: Gr. Holstein; 5 yrs.; fresh March 25, 1919; record from Jan. 1, 1919 to Jan. 1, 1920.

Production: Milk, 11,047 lbs.; fat, 369.3 lbs.; test, 3.6 per cent.

Feed (lbs.): Pasture, 184 (days); hay, 1,283; silage, 5,265; corn feed, 305; oats and bran, 757; corn fodder, 732; oil meal, 46.

Grapes, A. B., Downing

R. O. P. 571—Lilly: Gr. Guernsey; 9 yrs.; fresh Nov. 3, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 8,122 lbs.; fat, 391.5 lbs.; test, 4.8 per cent.

Feed (lbs.): Pasture, 153 (days); hay, 2,130; silage, 7,305; grain, 1,447; oil meal, 180; cottonseed meal, 92.

R. O. P. 572—May Pole 5th, 28,341: Reg. Guernsey; 12 yrs.; fresh May 6, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 8,917 lbs.; fat, 409.8 lbs.; test, 4.8 per cent.

Feed (lbs.): Pasture, 153 (days); hay, 2,130; silage, 7,305; grain, 1,652; oil meal, 180; cottonseed meal, 138.

Hausman, Harry F., Knapp

R. O. P. 573—Mutual Johanna of Rock, 198,574: Reg. Holstein; 9 yrs.; fresh March 20, 1919 and Jan. —, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 11,461 lbs.; fat, 401 lbs.; test, 3.5 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 7,130; hay, 2,580; grain, 2,579; bran, 553.

Radtke, E. H., Downing

R. O. P. 703—Evergreen Segis Asia, 284,563: Reg. Holstein; 4 yrs.; fresh Oct. 21, 1919; record from Oct. 1, 1919 to Oct. 1, 1920.

Production: Milk, 12,089 lbs.; fat, 443.1 lbs.; test, 3.7 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 8,120; hay, 2,336; mixed feed, 2,801.

R. O. P. 1008—Beauty: Gr. Holstein; 12 yrs.; fresh Jan. 31, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 9,245 lbs.; fat, 368.1 lbs.; test, 3.98 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 8,180; hay, 2,010; mixed feed, 1,792.

Schultz, John Jr., Boyceville

R. O. P. 1009—Babe: Gr. Holstein; 5 yrs.; fresh Feb. 18, 1919 and Dec. 28, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 11,317 lbs.; fat, 410 lbs.; test, 4.1 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 9,680; hay 2,376; grain, 1,528; oil meal, 85.

DUNN COUNTY NO. 6 ASSOCIATION

Farner, John Jr., Colfax

R. O. P. 911—Elmwood Farnerholm Daisy, 345,069: Reg. Holstein; 5 yrs.; fresh Jan. 15, 1919 and April 5, 1920; record from August, 1919 to August, 1920.

Production: Milk, 9,874 lbs.; fat, 369.2 lbs.; test, 3.74 per cent.

Feed (lbs.): Pasture, 152 (days); silage, 1,350; hay, 1,582; grain, 1,082.

R. O. P. 912—Farnerholm Queen De Kol, 345,073: Reg. Holstein; 4 yrs.; fresh Feb. 1, 1919 and Dec. 29, 1919; record from August, 1919 to August, 1920.

Production: Milk, 10,319 lbs.; fat, 365.8 lbs.; test, 3.54 per cent.

Feed (lbs.): Pasture, 152 (days); silage, 7,350; hay, 1,392; grain, 1,651.

R. O. P. 913—Pride Farnerholm De Kol, 345,071: Reg. Holstein; 4 yrs.; fresh Nov. 17, 1918 and Dec. 7, 1919; record from Aug., 1919 to Aug., 1920.

Production: Milk, 11,775 lbs.; fat, 401.1 lbs.; test, 3.41 per cent.

Feed (lbs.): Pasture, 152 (days); silage, 7,350; hay, 1,582; grain, 1,943.

EAU CLAIRE NO. 1 ASSOCIATION

Strader, R. A., Osseo

R. O. P. 642—Dorothy: Gr. Guernsey; 9 yrs.; fresh Jan. 24, 1918 and Jan. 2, 1919; record from Jan. 2, 1918 to Jan. 2, 1919.

Production: Milk, 8,192 lbs.; fat, 381.6 lbs.; test, 4.65 per cent.

Feed (lbs.): Pasture, 168 (days); hay, 3,391; silage, 10,145; bran, 298; oats, 777; barley, 246.

R. O. P. 643—Fannie No. 9: Gr. Guernsey; — yrs.; fresh Nov. 20, 1918 and Oct. 12, 1919; record from Jan. 1, 1919 to Dec. 31, 1919.

Production: Milk, 7,023 lbs.; fat, 369.5 lbs.; test, 5.22 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 4,900; hay, 1,428; barley, 1,111; oats, 588; bran, 142; wheat bran, 81; stover, 310.

R. O. P. 644—Hattie No. 12: Gr. Guernsey; 9 yrs.; fresh Oct. 30, 1918 and Jan. 1, 1920; record from Jan. 1, 1919 to Dec. 31, 1919.

Production: Milk, 6,489 lbs.; fat, 374.2 lbs.; test, 5.74 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 4,900; hay, 1,431; barley, 1,055; oats, 552; bran, 50; wheat hulls, 25; stover, 310.

R. O. P. 645—Jess No. 7: Gr. Guernsey; 2 yrs.; fresh Nov. 30, 1918 and Oct. 15, 1919; record from Jan. 1, 1919 to Dec. 31, 1919.

Production: Milk, 7,973 lbs.; fat, 386.3 lbs.; test, 4.9 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 4,900; hay, 1,432; barley, 1,130; oats, 607; bran, 170; wheat hulls, 80; stover, 310.

R. O. P. 646—No. 7 Nig: Gr. Jersey; 10 yrs.; fresh Dec. 27, 1917 and Nov. 15, 1918; record from Jan. 2, 1918 to Jan. 2, 1919.

Production: Milk, 8,546 lbs.; fat, 376.4 lbs.; test, 4.4 per cent.

Feed (lbs.): Pasture, 107 (days); hay, 1,863; silage, 6,754; bran, 354; oats, 528; barley, 304; oil meal, 198.

R. O. P. 647—Rose No. 6: Gr. Guernsey; — yrs.; fresh Nov. 11, 1918 and Nov. 10, 1919; record from Jan. 1, 1919 to Dec. 31, 1919.

Production: Milk, 8,559 lbs.; fat, 376.4 lbs.; test, 4.39 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 4,900; hay, 1,418; barley, 1,116; oats, 613; buckwheat, 172; straw, 86; stover, 310.

EDGAR ASSOCIATION

Endres, John, Route 1, Edgar

R. O. P. 704—Nowak: Gr. Holstein; 7 yrs.; fresh ———; record from Oct. 18, 1919 to Oct. 17, 1920.

Production: Milk, 8,328 lbs.; fat, 386.4 lbs.; test, 4.6 per cent.

Feed (lbs.): Pasture, 159 (days); clover chaff, 408; hay, 3,078; corn stalks, 25; Barley, 103; bran, 448; oats, 346; oil meal, 171; Wisconsin balanced ration, 333; Unicorn, 228; grain, 55.

Rietzow, R. A., Edgar

R. O. P. 705—Nigger: Gr. Holstein; 5 yrs.; fresh ———; record from Oct. 22, 1919 to Oct. 22, 1920.

Production: Milk, 9,722 lbs.; fat, 368.7 lbs.; test, 3.8 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 7,820; hay, 3,114; ground oats, 373; bran, 197; oil meal, 126; barley, 112; clover chaff, 300; grain, 446.

R. O. P. 706—Ringwood Maple Piebe, 213,467: Reg. Holstein; 7 yrs.; fresh Nov. 18, 1918 and Nov. 7, 1919; record from Oct. 22, 1919 to Oct. 21, 1920.

Production: Milk, 10,330 lbs.; fat, 375.5 lbs.; test, 3.6 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 7,820; hay, 4,260; ground oats, 504; bran, 368; oil meal, 126; barley, 195; grain, 482.

ELKHORN ASSOCIATION

Dunlap, Leo D., Lake Geneva

R. O. P. 802—Edith: Reg. Guernsey; 6 yrs.; fresh Dec. 16, 1918 and Nov. 6, 1919; record from Nov. 1, 1919 to Nov. 1, 1920.

Production: Milk, 7,547 lbs.; fat, 378.9 lbs.; test, 5.02 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 9,509; hay, 1,523; bran, 1,306; oil meal, 181; middlings, 146; True Value dairy feed, 150.

R. O. P. 803—Eva: Gr. Holstein; 4 yrs.; fresh Nov. 29, 1918 and Nov. 19, 1919; record from Nov. 1, 1919 to Nov. 1, 1920.

Production: Milk, 8,892 lbs.; fat, 372.5 lbs.; test, 4.19 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 9,509; hay, 1,523; bran, 1,396; oil meal, 193; middlings, 191; oats, 186.

R. O. P. 804—Queenie: Gr. Guernsey; 4 yrs.; fresh Oct. 12, 1918 and Oct. 7, 1919; record from Nov. 1, 1919 to Nov. 1, 1920.

Production: Milk, 7,096 lbs.; fat, 370.4 lbs.; test, 5.2 per cent.

Feed (lbs.): Pasture, 183 (days); hay, 1,523; silage, 9,509; oats, 366; bran, 1,396; oil meal, 1,565; middlings, 191.

Foster, S. F. & Sons, Elkhorn

R. O. P. 1010—Longlegs: Gr. Shorthorn; 5 yrs.; fresh Nov. 23, 1919; record from Nov. 1, 1919 to Nov. 1, 1920.

Production: Milk, 10,263 lbs.; fat, 427.2 lbs.; test, 4.16 per cent.

Feed (lbs.): Pasture, 178 (days); silage, 3,767; hay, 1,619; corn bales, 45; shredded fodder, 529; molasses, 658; grain, 2,987; oil meal, 50.

Whitmore, A. D., Lyons

R. O. P. 1011—Colantha Hamilton Hengerveld, 323,868: Reg. Holstein; 4 yrs.; fresh Jan. 22, 1920 and Dec. 29, 1920; record from Jan. 1, 1920 to Jan. 1, 1921.

Production: Milk, 14,672 lbs.; fat, 432.9 lbs.; test, 2.94 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 5,581; hay, 2,871; beet pulp, 619; grain mixture, 2,539; molasses, 116; salt, 25; cow chow, 233; Stev-ens, 44, 589; beets, 1,240; corn fodder, 30.

ELLINGTON ASSOCIATION

Breitrick & Sons, F. D., Hortonville

R. O. P. 575—Belle No. 6: Gr. Guernsey; 8 yrs.; fresh Oct. 2, 1918 and Sept. 22, 1919; record from March 31, 1919 to April 1, 1920.

Production: Milk, 7,733 lbs.; fat, 397.7 lbs.; test, 5.14 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,360; hay, 471; stover and fodder, 3,029.

R. O. P. 576—Molly No. 8: Gr. Guernsey; 11 yrs.; fresh April 12, 1919; record from March 31, 1919 to April 1, 1920.

Production: Milk, 9,408 lbs.; fat, 424.5 lbs.; test, 4.51 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,360; hay, 471; stover and fodder, 3,029.

R. O. P. 577—Queen, No. 12: Gr. Guernsey; 7 yrs.; fresh Feb. 14, 1919 and March 23, 1920; record from March 31, 1919 to April 1, 1920.

Production: 8,857 lbs.; fat, 392.2 lbs.; test, 4.43 per cent.

Feed (lbs.): Pasture, 153 (days); silage 6,391; hay, 471; stover and fodder, 3,029.

Burns; Robert C., Hortonville

R. O. P. 615—Bess No. 12: Gr. Holstein; 7 yrs.; fresh Aug., 1918 and Sept. 5, 1919; record from March 31, 1919 to Apr. 1, 1920.

Production: Milk, 10,653 lbs.; fat, 380.9 lbs.; test, 3.58 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 8,139; hay, 186; stover, 998.

R. O. P. 616—Star No. 7: Gr. Holstein; 6 yrs.; fresh Jan. 5, 1919 and Dec. 5, 1919; record from March 31, 1919 to April 1, 1920.

Production: Milk, 11,695 lbs.; fat, 417 lbs.; test, 3.56 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 8,139; hay, 186; stover, 998.

R. O. P. 617—White No. 4: Gr. Holstein; 4 yrs.; fresh Aug. 19, 1918; record from March 31, 1919 to April 1, 1920.

Production: Milk, 9,386 lbs.; fat, 392.3 lbs.; test, 4.18 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 8,139; hay, 186; stover, 998.

Dietz Brothers, Route 3, Appleton

R. O. P. 562—Flory No. 4: Gr. Guernsey; 10 yrs.; fresh April 1, 1919 and March 21, 1920; record from March 31, 1919 to April 1, 1920.

Production: Milk, 8,636 lbs.; fat, 411.6 lbs.; test, 4.77 per cent.

Feed (lbs.): Pasture, 162 (days); silage, 7,700; hay, 1,460; stover, 1,407.

Kreutzberg, Henry, Hortonville

R. O. P. 578—Maud: Gr. Holstein; 5 yrs.; fresh April 28, 1918 and March 28, 1919; record from March 31, 1919 to April 1, 1920.

Production: Milk, 10,072 lbs.; fat, 391.4 lbs.; test, 3.89 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 6,941; hay, 846; stover, 3,360.

Laird, S. A., Shiocton

R. O. P. 563—Nellie: Gr. Guernsey; 4 yrs.; fresh Dec. 15, 1918 and Jan. 16, 1919; record from March 31, 1919 to April 1, 1920.

Production: Milk, 8,320 lbs.; fat, 402.2 lbs.; test, 4.83 per cent.

Feed (lbs.): Pasture, 155 (days); silage, 7,940; hay, 1,880; roots, 310.

R. O. P. 564—Queen: Gr. Guernsey; 7 yrs.; fresh May 1, 1918 and May 29, 1919; record from March 31, 1919 to April 1, 1920.

Production: Milk, 8,378 lbs.; fat, 375.7 lbs.; test, 4.48 per cent.

Feed (lbs.): Pasture, 155 (days); silage, 7,738; hay, 1,851; roots, 310.

Lohrenz, Ed, Hortonville

R. O. P. 618—Big Star: Gr. Guernsey; 5 yrs.; fresh Feb. 1, 1919 and Jan. 12, 1920; record from March 31, 1919 to April 1, 1920.

Production: Milk, 9,270 lbs.; fat, 475.5 lbs.; test, 5.13 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 7,459; hay, 947; corn stover, 1,033; corn fodder, 638.

R. O. P. 619—Rose: Gr. Guernsey; 8 yrs.; fresh Nov. 19, 1918 and Sept. 1, 1919; record from March 31, 1919 to April 1, 1920.

Production: Milk, 8,734 lbs.; fat, 460.7 lbs.; test, 5.27 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 7,397; hay, 780; stover; 1,023; corn fodder, 638.

R. O. P. 620—Queen: Gr. Guernsey; 12 yrs.; fresh Jan. 15, 1919 and Jan. 3, 1920; record from March 31, 1919 to April 1, 1920.

Production: Milk, 9,724 lbs.; fat, 377.1 lbs.; test, 3.88 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 7,459; hay, 962; stover, 1,023; corn fodder, 638.

Lohrenz, Ray W., Hortonville

R. O. P. 565—Black: Gr. Holstein; fresh Jan. 13, 1919 and Jan. 19, 1920; record from March 31, 1919 to April 1, 1920.

Production: Milk, 10,978 lbs.; fat, 394.8 lbs.; test, 3.60 per cent.

Feed (lbs.): Pasture, 162 (days); silage, 9,591; hay, 1,436; stover, 613.

Missling, W. R. & Son, Hortonville

R. O. P. 566—Segis Prescott Shields, 206,900; Reg. Holstein; 6 yrs.; fresh April 9, 1919; record from March 31, 1919 to April 1, 1920.

Production: Milk, 16,972 lbs.; fat, 653.1 lbs.; test, 3.85 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 9,702; hay, 2,646; roots, 270; molasses, 76.

R. O. P. 567—Queen: Gr. Holstein; 5 yrs.; fresh May 1, 1919; record from March 31, 1919 to April 1, 1920.

Production: Milk, 9,524 lbs.; fat, 382.3 lbs.; test, 4.01 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 6,733; hay, 1,541; stover, 286.

Riesenweber, Henry, Route 3, Appleton

R. O. P. 621—Molly: Gr. Guernsey; 4 yrs.; fresh May 3, 1919; record from March 31, 1919 to April 1, 1920.

Production: Milk, 7,995 lbs.; fat, 408.2 lbs.; test, 5.11 per cent.

Feed (lbs.): Pasture, 162 (days); silage, 6,802; hay, 994; stover, 1,271.

Sauberlich, G. H., Route 3, Appleton

R. O. P. 579—Beauty: Gr. Guernsey; 5 yrs.; fresh March, 1919; record from March 31, 1919 to April 1, 1920.

Production: Milk, 9,204 lbs.; fat, 384.9 lbs.; test, 4.18 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,917; hay, 1,520; stover, 1,163.

R. O. P. 580—Daisy: Gr. Guernsey; 8 yrs.; fresh Dec. 4, 1919 record from March 31, 1919 to April 1, 1920.

Production: Milk, 8,636 lbs.; fat, 379.5 lbs.; test, 4.39 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,647; hay, 1,517; stover, 1,163.

R. O. P. 581—Lady: Gr. Guernsey; 4 yrs.; fresh March 15, 1919; record from March 31, 1919 to April 1, 1920.

Production: Milk, 8,160 lbs.; fat, 404 lbs.; test, 4.95 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 6,001; hay, 1,652; stover, 1,163.

Zahrt, Frank H., Shiocton

R. O. P. 582—Grace: Gr. Jersey; 8 yrs.; fresh Dec. 7, 1918 and Jan. 7, 1920; record from March 31, 1919 to April 1, 1920.

Production: Milk, 8,199 lbs.; fat, 414.5 lbs.; test, 5.05 per cent.

Feed (lbs.): Pasture, 159 (days); silage, 7,838; hay, 1,470; stover, 689.

ELLSWORTH ASSOCIATION

Anderson, Geo., Ellsworth

R. O. P. 1150—No. 8 Chilly: Gr. Guernsey; 4 yrs.; fresh Dec. 6, 1919 and Nov. 23, 1920; record from Aug. 1, 1920 to Aug. 1, 1921.

Production: Milk, 8,199 lbs.; fat, 401.9 lbs.; test, 4.90 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 3,800; hay, 1,880; oats, 926; bran, 740; oil meal, 68.

R. O. P. 1151—No. 7 Ruby: Gr. Red Polled; 8 yrs.; fresh Feb. 17, 1920 and Jan. 15, 1921; record from Aug. 1, 1920 to Aug. 1, 1921.

Production: Milk, 9,322 lbs.; fat, 385.9 lbs.; test, 4.14 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 3,440; hay, 1,880; bran, 746; oats, 460; oil meal, 68.

R. O. P. 1152—No. 12 Spot: Gr. Guernsey; 5 yrs.; fresh April 16, 1920 and March 21, 1921; record from Aug. 1, 1920 to Aug. 1, 1921.

Production: Milk, 9,215 lbs.; fat, 425.3 lbs.; test, 4.6 per cent.

Feed (lbs.): Pasture, 185 (days); silage, 3,645; hay, 1,880; oats, 660; bran, 474; oil meal, 68.

Anderson, A. M. & Son, Ellsworth

R. O. P. 1170—No. 17 Dolly: Gr. Guernsey; 6 yrs.; fresh Jan. 10, 1919 and Dec. 20, 1920; record from Aug. 1, 1920 to Aug. 1, 1921.

Production: Milk, 8,344 lbs.; fat, 391.6 lbs.; test, 4.69 per cent.

Feed (lbs.): Pasture, 214 (days); silage, 6,370; hay, 1,210; oats, 498; barley, 330; bran, 330; oil meal, 270.

Crosby, Oscar, Bay City

R. O. P. 1153—Della: Gr. Guernsey; 5 yrs.; fresh Oct. 7, 1920; record from July 1, 1920 to July 1, 1921.

Production: Milk, 9,222 lbs.; fat, 458.2 lbs.; test, 4.97 per cent.

Feed (lbs.): Pasture, 92 (days); silage, 4,343; hay, 2,065; oats, 645; barley, 360; bran, 360; oil meal, 270.

Kline, Albert, Ellsworth

R. O. P. 1154—Beauty: Gr. Guernsey; 2 yrs.; fresh Dec. 30, 1919 and Jan. 25, 1921; record from July 1, 1920 to July 1, 1921.

Production: Milk, 8,665 lbs.; fat, 424.4 lbs.; test, 4.9 per cent.

Feed (lbs.): Pasture, 154 (days); silage, 4,000; hay, 1,550; oats, 816; barley, 444; bran, 444; oil meal, 266.

R. O. P. 1155—Guernsey: Gr. Guernsey; 10 yrs.; fresh Nov. 26, 1919 and Dec. 8, 1920; record from July 1, 1920 to June 30, 1921.

Production: Milk, 8,850 lbs.; fat, 421.5 lbs.; test, 4.76 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 4,000; hay, 1,550; oats, 1,025; barley, 473; bran, 473; oil meal, 297.

R. O. P. 1156—Jersey: Gr. Jersey; 5 yrs.; fresh May 20, 1919 and June 25, 1920; record from July 1, 1920 to July 1, 1921.

Production: Milk, 8,249 lbs.; fat, 397.6 lbs.; test, 4.82 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 4,000; hay, 1,550; oats, 1,018; barley, 478; bran, 478; oil meal, 286.

R. O. P. 1157—Sally: Gr. Guernsey; 7 yrs.; fresh May 27, 1920 and May 15, 1921; record from July 1, 1920 to July 1, 1921.

Production: Milk, 8,102 lbs.; fat, 385.6 lbs.; test, 4.76 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 4,000; hay, 1,550; oats, 882; barley, 430; bran, 430; oil meal, 236.

Mumford, G. W., Ellsworth

R. O. P. 1158—Jersey: Gr. Jersey; 6 yrs.; fresh —; record from July 1, 1920 to July 1, 1921.

Production: Milk, 8,336 lbs.; fat, 458.1 lbs.; test, 5.5 per cent.

Feed (lbs.): Pasture, 214 (days); silage, 4,970; hay, 2,032; oats, 1,051; corn, 402; barley, 555; bran, 354; oil meal, 295.

R. O. P. 1159—Red Rose: Gr. Red Polled; 5 yrs.; fresh May 20, 1919 and June 28, 1920; record from July 1, 1920 to July 1, 1921.

Production: Milk, 8,517 lbs.; fat, 405.5 lbs.; test, 4.76 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 3,792; hay, 2,032; oats, 883; corn, 482; barley, 635; bran, 372; oil meal, 293.

EMPIRE ASSOCIATION

Braun, John & Sons, Eden

R. O. P. 914—Big Blue Cow: Gr. Holstein; 7 yrs.; fresh Jan. 5, 1919 and Dec. 12, 1919; record from Dec. 1, 1919 to Dec. 1, 1920.

Production: Milk, 10,195 lbs.; fat, 391.5 lbs.; test, 3.84 per cent.

Feed (lbs.): Pasture, 168 (days); corn silage, 6,685; mixed hay, 2,580; mixed grain, 660.

R. O. P. 915—Shorty: Gr. Holstein; 5 yrs.; fresh Feb. 1, 1919 and Jan. 1, 1920; record from Jan. 1, 1920 to Dec. 1, 1920.

Production: Milk, 10,504 lbs.; fat, 375.2 lbs.; test, 3.57 per cent.

Feed (lbs.): Pasture, 168 (days); corn silage, 5,935; mixed hay, 2,040; mixed feeds, 560.

R. O. P. 916—Slim Teated Cow: Gr. Holstein; 7 yrs.; fresh Nov. 15, 1919 and Oct. 20, 1920; record from Dec. 1, 1919 to Dec. 1, 1920.

Production: Milk, 10,779 lbs.; fat, 407 lbs.; test, 3.78 per cent.

Feed (lbs.): Pasture, 169 (days); corn silage, 6,685; mixed hay, 2,580; grain, 710.

R. O. P. 917—White Tail: Gr. Holstein; 7 yrs.; fresh Dec. 1, 1919 and Nov. 15, 1920; record from Dec. 1, 1919 to Dec. 1, 1920.

Production: Milk, 10,642 lbs.; fat, 374.3 lbs.; test, 3.52 per cent.

Feed (lbs.): Pasture, 168 (days); corn silage, 6,685; mixed hay, 2,580; mixed grain, 710.

Hodorff, Andrew G., Campbellsport

R. O. P. 918—Big White: Gr. Holstein; 9 yrs.; fresh Dec. 24, 1919 and Nov. 28, 1920; record from Dec. 20, 1919 to Dec. 20, 1920.

Production: Milk, 14,188 lbs.; fat, 470.3 lbs.; test, 3.31 per cent.

Feed (lbs.): Pasture, 178 (days); silage, 10,140; alfalfa hay, 2,196; mixed grain, 2,146.

R. O. P. 919—Jane: Gr. Holstein; 4 yrs.; fresh April 20, 1919 and Feb. 20, 1920; record from Dec. 20, 1919 to Dec. 20, 1920.

Production: Milk, 11,009 lbs.; fat, 410 lbs.; test, 3.72 per cent.

Feed (lbs.): Pasture, 178 (days); silage, 8,940; alfalfa hay, 1,956; mixed grain, 1,215.

R. O. P. 920—Pet Pansy: Gr. Holstein; 7 yrs.; fresh Dec. 19, 1919 and Nov. 25, 1920; record from Dec. 20, 1919 to Dec. 20, 1920.

Production: Milk, 10,880 lbs.; fat, 449.2 lbs.; test, 4.13 per cent.

Feed (lbs.): Pasture, 178 (days); silage, 10,140; alfalfa hay, 2,196; mixed grain, 1,979.

R. O. P. 921—Snowflake: Native; 9 yrs.; fresh Feb. 17, 1919 and Feb. 15, 1920; record from Dec. 20, 1919 to Dec. 20, 1920.

Production: Milk, 9,278 lbs.; fat, 368.5 lbs.; test, 3.97 per cent.

Feed (lbs.): Pasture, 178 (days); silage, 8,940; alfalfa hay, 1,956; mixed grain, 1,140.

R. O. P. 922—Sterling Aaggie Grace Doris, 308,203: Reg. Holstein; 4 yrs.; fresh May 6, 1919 and March 27, 1920; record from Dec. 20, 1919 to Dec. 20, 1920.

Production: Milk, 12,201 lbs.; fat, 419.7 lbs.; test, 3.43 per cent.

Feed (lbs.): Pasture, 178 (days); silage, 8,940; alfalfa hay, 1,956; mixed grain, 960.

Korrer, E. H., Fond du Lac

R. O. P. 923—Queen Mooie Fobes, 368,316: Reg. Holstein; 6 yrs.; fresh Nov. 9, 1919 and bred April 21, 1920; record from Nov. 20, 1919 to Nov. 20, 1920.

Production: Milk, 11,935 lbs.; fat, 376.4 lbs.; test, 3.15 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,000; hay, 2,400; grain, 2,010.

FORT ATKINSON ASSOCIATION

Becker, Walter G., Fort Atkinson

R. O. P. 668—Florence of Maple Grove, 26,792: Reg. Guernsey; 12 yrs.; fresh Jan. 2, 1919 and Nov. 10, 1919; record from May 1, 1919 to April 30, 1920.

Production: Milk, 10,461 lbs.; fat, 480.3 lbs.; test, 4.59 per cent.

Feed (lbs.): Pasture, 103 (days); silage, 5,528; timothy hay, 830; fodder, 140; grain, 2,113; green corn, 49; oil meal, 45; stover, 1,500.

R. O. P. 669—Florence's Pearly of Oak Ridge, 56,917: Reg. Guernsey; 4 yrs.; fresh April 18, 1919 and March 12, 1920; record from May 1, 1919 to April 30, 1920.

Production: Milk, 7,022 lbs.; fat, 379.12 lbs.; test, 5.4 per cent.

Feed (lbs.): Pasture, 103 (days); silage, 5,528; timothy hay, 830; fodder, 140; grain, 1,323; oil meal, 45; stover, 1,500.

R. O. P. 670—Marilla of Oak Ridge, 30,000: Reg. Guernsey; 7 yrs.; fresh March 25, 1919 and Feb. 29, 1920; record from May 1, 1919 to April 30, 1920.

Production: Milk, 8,373 lbs.; fat, 366.4 lbs.; test, 4.38 per cent.

Feed (lbs.): Pasture, 103 (days); silage, 5,528; timothy hay, 830; fodder, 140; grain, 1,296; stover, 1,500.

Burchard & Peters, Fort Atkinson

R. O. P. 648—Alta: Gr. Guernsey; 6 yrs.; fresh Oct. 26, 1919; record from May 1, 1919 to May 1, 1920.

Production: Milk, 8,710 lbs.; fat, 421 lbs.; test, 4.83 per cent.

Feed (lbs.): Pasture, 153 days; silage, 6,315; alfalfa and blue grass hay, 2,154; grain, 2,380; stover, 900.

R. O. P. 649—Daisy: Gr. Guernsey; — yrs.; fresh Oct. 1, 1919; record from May 1, 1919 to April 30, 1920.

Production: Milk, 8,738 lbs.; fat, 393.1 lbs.; test, 4.5 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,315; alfalfa and blue grass hay, 2,154; grain, 2,432; stover, 900.

R. O. P. 650—Ella: Gr. Guernsey; 6 yrs.; fresh Jan. 26, 1920; record from May 1, 1919 to April 30, 1920.

Production: Milk, 9,468 lbs.; fat, 466.4 lbs.; test, 4.92 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,315; alfalfa and blue grass hay, 2,154; grain, 2,301; stover, 900.

R. O. P. 650a—Ella: Gr. Guernsey; 7 yrs.; fresh Jan. 26, 1920; record from May 1, 1920 to April 30, 1921.

Production: Milk, 9,821 lbs.; fat, 473.5 lbs.; test, 4.8 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,525; hay, 1,783; dairy feed, 465; grain, 1,058; stover, 1,500; beet pulp, 180.

R. O. P. 1014—Flora: Gr. Guernsey; 5 yrs.; fresh Jan. 20, 1920 and Dec. 12, 1921; record from May 1, 1920 to April 30, 1921.

Production: Milk, 6,703 lbs.; fat, 388.4 lbs.; test, 5.8 per cent.

Feed (lbs.): Pasture, 152 (days); silage, 6,525; hay, 1,733; dairy feed, 217; corn fodder, 42; grain, 999; stover, 1,500; beet pulp, 180.

R. O. P. 1015—Pansy: Gr. Guernsey; 2 yrs.; fresh April 17, 1920; record from May 1, 1920 to April 30, 1921.

Production: Milk, 7,552 lbs.; fat, 366.7 lbs.; test, 4.9 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,525; hay, 1,783; dairy feed, 99; corn fodder, 42; grain, 755; stover, 1,500; beet pulp, 180.

Christ & Hackbarth, Fort Atkinson

R. O. P. 1016—Anze De Kol of Rock, 357,134: Reg. Holstein; 3 yrs.; fresh Feb. 20, 1920; record from May 1, 1920 to April 30, 1921.

Production: Milk, 8,224 lbs.; fat, 371.8 lbs.; test, 4.5 per cent.

Feed (lbs.): Pasture, 123 (days); silage, 9,585; hay, 1,395; grain, 2,862.

R. O. P. 1017—Myrtle Johanna Pietertje, 293,749: Reg. Holstein; 5 yrs.; fresh May 22, 1920; record from May 1, 1920 to April 30, 1921.

Production: Milk, 11,229 lbs.; fat, 366 lbs.; test, 3.3 per cent.

Feed (lbs.): Pasture, 123 (days); silage, 9,435; hay, 1,395; grain, 2,856.

R. O. P. 1018—Queen Millie Mercedes, 231,848: Reg. Holstein; 6 yrs.; fresh Nov. 23, 1919 and Oct. 1, 1920; record from May 1, 1920 to April 30, 1921.

Production: Milk, 11,774 lbs.; fat, 407.6 lbs.; test, 3.5 per cent.

Feed (lbs.): Pasture, 123 (days); silage, 9,585; hay, 1,395; grain, 3,103.

R. O. P. 1019—Winnie Barefoot Millie, 199,818: Reg. Holstein; 7 yrs.; fresh Feb. 22, 1920; record from May 1, 1920 to April 30, 1921.

Production: Milk, 12,535 lbs.; fat, 421.9 lbs.; test, 3.4 per cent.

Feed (lbs.): Pasture, 123 (days); silage, 9,585; hay, 1,395; grain, 3,505; green corn, 5.

Cooper, E. F. and J. W., Whitewater

R. O. P. 1020—Lady Lakeside Pietertje, 329,561: Reg. Holstein, 5 yrs.; fresh Sept. 10, 1919 and Oct. 11, 1920; record from May 1, 1920 to April 30, 1921.

Production: Milk, 12,143 lbs.; fat, 400.6 lbs.; test, 3.3 per cent.

Feed (lbs.): Pasture, 92 (days); silage, 7,186; hay, 1,545; grain, 2,603; stover, 1,800.

Erdman, Louis C., Jefferson

R. O. P. 1021—Daisy: Gr. Guernsey; 6 yrs.; fresh ———; record from May 1, 1920 to April 30, 1921.

Production: Milk, 6,873 lbs.; fat, 380 lbs.; test, 5.5 per cent.

Feed (lbs.): Pasture, 137 (days); silage, 3,620; hay, 1,317; grain, 1,764; stover, 2,000.

R. O. P. 1022—Jersey: Gr. Jersey; 5 yrs.; fresh Nov. 7, 1920; record from May 1, 1920 to April 30, 1921.

Production: Milk, 10,570 lbs.; fat, 382 lbs.; test, 3.6 per cent.

Feed (lbs.): Pasture, 137 (days); silage, 3,620; hay, 1,317; grain, 1,796; stover, 2,000.

Groeler, E. W., Fort Atkinson

R. O. P. 651—Beula's Lovelace, 47,675: Reg. Guernsey; 5 yrs.; fresh Nov. 30, 1919; record from May 1, 1919 to April 30, 1920.

Production: Milk, 8,295 lbs.; fat, 377 lbs.; test, 4.54 per cent.

Feed (lbs.): Pasture, 139 (days); silage, 5,629; timothy hay, 1,854; fodder, 60; grain, 1,937; stover, 900.

R. O. P. 652—Veda Pride, 73,525: Reg. Guernsey; 2 yrs.; fresh March 7, 1920; record from May 1, 1919 to April 30, 1920.

Production: Milk, 6,952 lbs.; fat, 387.2 lbs.; test, 5.57 per cent.

Feed (lbs.): Pasture, 139 (days); silage, 5,629; timothy hay, 1,854; grain, 1,899; fodder, 60; stover, 900.

Huppert, G. W., Fort Atkinson

R. O. P. 653—No. 1: Gr. Holstein; 8 yrs.; fresh Oct. 5, 1918 and Oct. 8, 1919; record from May 1, 1919 to April 30, 1920.

Production: Milk, 10,336 lbs.; fat, 375.5 lbs.; test, 3.63 per cent.

Feed (lbs.): Pasture, 49 (days); silage, 13,482; alfalfa hay, 993; grain, 2,558.

R. O. P. 653a—No. 1: Gr. Holstein; 10 yrs.; fresh Oct. 8, 1919; record from May 1, 1920 to April 30, 1921.

Production: Milk, 12,025 lbs.; fat, 404.9 lbs.; test, 3.4 per cent.

Feed (lbs.): Pasture, 92 (days); silage, 10,210; hay, 1,277; grain, 2,557; stover, 2,400.

R. O. P. 654—No. 3: Gr. Holstein; 6 yrs.; fresh April 5, 1919; record from May 1, 1919 to April 30, 1920.

Production: Milk, 10,261 lbs.; fat, 385.7 lbs.; test, 3.76 per cent.

Feed (lbs.): Pasture, 49 (days); silage, 13,482; hay, 993; grain, 2,072.

R. O. P. 655—No. 9: Gr. Holstein; 9 yrs.; fresh Oct. 5, 1918 and Nov. 24, 1919; record from May 1, 1919 to April 30, 1920.

Production: Milk, 12,210 lbs.; fat, 446.7 lbs.; test, 3.65 per cent.

Feed (lbs.): Pasture, 49 (days); silage, 13,482; alfalfa hay, 993; grain, 2,765.

R. O. P. 655a—No. 9: Gr. Holstein; 9 yrs.; fresh Nov. 24, 1919 and Nov. 24, 1920; record from May 1, 1920 to April 30, 1921.

Production: Milk, 13,057 lbs.; fat, 424.3 lbs.; test, 3.3 per cent.

Feed (lbs.): Pasture, 92 (days); silage, 10,210; hay, 1,277; grain, 2,542; green corn \$3.50; stover, 2,400.

R. O. P. 1023—No. 5: Gr. Holstein; 7 yrs.; fresh April 8, 1920 and Feb. 26, 1921; record from May 1, 1920 to April 30, 1921.

Production: Milk, 11,112 lbs.; fat, 378.1 lbs.; test, 3.4 per cent.

Feed (lbs.): Pasture, 92 (days); silage, 10,210; hay, 1,277; grain, 1,626; stover, 2,400.

R. O. P. 1024—No. 2: Gr. Holstein; 9 yrs.; fresh Nov. 19, 1919 and Nov. 1, 1920; record from May 1, 1920 to April 30, 1921.

Production: Milk, 13,626 lbs.; fat, 451.6 lbs.; test, 3.3 per cent.

Feed (lbs.): Pasture, 92 (days); silage, 10,510; hay, 1,277; grain, 2,754; stover, 2,400.

Pester, C. J., Whitewater

R. O. P. 1025—Maggie Segis Beets, ———: Reg. Holstein; 5 yrs.; fresh Nov. 17, 1919 and Nov. 28, 1920; record from May 1, 1920 to April 30, 1921.

Production: Milk, 10,575 lbs.; fat, 370.3 lbs.; test, 3.5 per cent.

Feed (lbs.): Pasture, 132 (days); silage, 9,323; hay, 1,332; grain, 2,849; beets, 1,116.

Main, H. A., Fort Atkinson

R. O. P. 656—Park's Yeksa Queen 3d, 38,813: Reg. Guernsey; 7 yrs.; fresh Nov. 19, 1918; record from May 1, 1919 to April 30, 1920.

Production: Milk, 9,070 lbs.; fat, 411.7 lbs.; test, 4.54 per cent.

Feed (lbs.): Pasture, 31 (days); silage, 7,635; timothy hay, 2,529; alfalfa hay, 150; grain, 3,254; oil meal, 142; stover, 900.

Royce, L. B., Estate (per H. A. Main), Fort Atkinson

R. O. P. 659—Lady Taft of Denmark, 42,126: Reg. Guernsey; 7 yrs.; fresh Oct. 28, 1918; record from May 1, 1919 to April 30, 1920.

Production: Milk, 7,589 lbs.; fat, 391.5 lbs.; test, 5.15 per cent.

Feed (lbs.): Pasture, — (days); silage, 10,528; alfalfa hay, 1,972; grain, 2,353.

Purdy, Orrin, Fort Atkinson

R. O. P. 657—Lady Pietertje Beets De Kol 2d, 209,682: Reg. Holstein; 6 yrs.; fresh Sept. 6, 1918 and Dec. 12, 1919; record from May 1, 1919 to April 30, 1920.

Production: Milk, 11,321 lbs.; fat, 437 lbs.; test, 3.86 per cent.

Feed (lbs.): Pasture, 164 (days); silage, 6,735; hay, 1,893; oil meal, 12; grain, 2,022; green corn, \$1.50.

R. O. P. 658—Queen Pietertje Canary De Kol, 353,321: Reg. Holstein; 3 yrs.; fresh Feb. 1, 1919 and Dec. 8, 1919; record from May 1, 1919 to April 30, 1920.

Production: Milk, 10,821 lbs.; fat, 442.5 lbs.; test, 4.10 per cent.

Feed (lbs.): Pasture, 164 (days); silage, 6,735; marsh hay, 1,893; oil meal, 12; grain, 1,992.

Stark, Will A., Route 3, Jefferson

R. O. P. 665—Guernsey: Gr. Guernsey; 14 yrs.; fresh Sept. 6, 1919; record from May 1, 1919 to April 30, 1920.

Production: Milk, 10,034 lbs.; fat, 475.4 lbs.; test, 4.74 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 3,710; clover hay, 2,569; oil meal, 30; grain, 3,372; green corn, 10.

R. O. P. 666—Miriam of Sunny Brook, 39,861: Reg. Guernsey; 8 yrs.; fresh Oct. 6, 1918 and Nov. 30, 1919; record from May 1, 1919 to April 30, 1920.

Production: Milk, 8,320 lbs.; fat, 457.4 lbs.; test, 5.50 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 4,223; clover hay, 2,747; grain, 3,109; green corn, \$2.50; beets, 1,223.

R. O. P. 666a—Miriam of Sunny Brook, 39,861: Reg. Guernsey; 7 yrs.; fresh Nov. 30, 1919 and Feb. 3, 1921; record from May 1, 1920 to April 30, 1921.

Production: Milk, 10,566 lbs.; fat, 583.4 lbs.; test, 5.5 per cent.

Feed (lbs.): Pasture, 30 (days); silage, 5,401; hay, 3,251; grain, 4,119; green alfalfa, 620; green corn, \$1.50; beets, 2,250.

R. O. P. 667—Spotswood: Gr. Guernsey; 6 yrs.; fresh Feb. 18, 1920; record from May 1, 1919 to April 30, 1920.

Production: Milk, 9,008 lbs.; fat, 434.9 lbs.; test, 4.83 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 3,710; clover hay, 2,507; oil meal, 30; grain, 2,383; green corn, \$2.50.

R. O. P. 667a—Spotswood: Gr. Guernsey; 7 yrs.; fresh Feb. 18, 1919 and Feb. 7, 1921; record from May 1, 1920 to April 30, 1921.

Production: Milk, 8,982 lbs.; fat, 439.2 lbs.; test, 4.9 per cent.

Feed (lbs.): Pasture, 91 (days); silage, 5,308; hay, 2,429; grain, 2,626; stover, 500.

R. O. P. 1026—Dairy Maid's Mirian, 53,627: Reg. Guernsey; 5 yrs.; fresh April 1, 1920 and March 7, 1921; record from May 1, 1920 to April 30, 1921.

Production: Milk, 9,026 lbs.; fat, 416.4 lbs.; test, 4.6 per cent.

Feed (lbs.): Pasture, 30 (days); silage, 5,401; hay, 3,251; grain, 4,054; green alfalfa, 620; beets, 2,250.

R. O. P. 1027—Imperial Dandelion of Sarnia, 58,768: Reg. Guernsey; 6 yrs.; fresh June 26, 1920; record from May 1, 1920 to April 30, 1921.

Production: Milk, 9,863 lbs.; fat, 491.6 lbs.; test, 5 per cent.

Feed (lbs.): Pasture, 30 (days); silage, 5,401; hay, 3,251; green alfalfa, 620; grain, 3,734; beets, 2,950.

R. O. P. 1028—Imperial Nell of Arroyo, 47,086: Reg. Guernsey; 8 yrs.; fresh Feb. 14, 1920; record from May 1, 1920 to April 30, 1921.

Production: Milk, 8,848 lbs.; fat, 532.7 lbs.; test, 6 per cent.

Feed (lbs.): Pasture, 30 (days); silage, 5,401; hay, 3,251; grain, 3,994; green alfalfa, 650; beets, 1,500.

R. O. P. 1029—Jersey: Gr. Jersey; 16 yrs.; fresh April 1, 1920 and Feb. 18, 1921; record from May 1, 1920 to April 30, 1921.

Production: Milk, 8,655 lbs.; fat, 385.3 lbs.; test, 4.5 per cent.

Feed (lbs.): Pasture, 92 (days); silage, 5,308; hay, 2,429; grain, 2,679; stover, 500.

Taylor, Frank, Route 3, Whitewater

R. O. P. 1030—Big Quarter: Gr. Holstein; 6 yrs.; fresh March 6, 1920 and March 5, 1921; record from May 1, 1920 to April 30, 1921.

Production: Milk, 10,940 lbs.; fat, 375.9 lbs.; test, 3.3 per cent.

Feed (lbs.): Pasture, 102 (days); silage, 9,020; hay, 1,547; grain, 1,211; green corn, \$3.50; stover, 2,000.

R. O. P. 1031—Black Back: Gr. Holstein; 6 yrs.; fresh March 3, 1920; record from May 1, 1920 to April 30, 1921.

Production: Milk, 12,056 lbs.; fat, 508.2 lbs.; test, 4.2 per cent.

Feed (lbs.): Pasture, 102 (days); silage, 9,020; hay, 1,547; grain, 1,652; green corn, \$3.50; stover, 2,000.

R. O. P. 1032—Fanny: Gr. Holstein; 3 yrs.; fresh Sept. 22, 1920; record from May 1, 1920 to April 30, 1921.

Production: Milk, 9,125 lbs.; fat, 367.2 lbs.; test, 4 per cent.

Feed (lbs.): Pasture, 102 (days); silage, 9,020; hay, 1,547; grain, 1,821; green corn, \$3.50; stover, 2,000.

R. O. P. 1033—Snowball: Gr. Holstein; 5 yrs.; fresh Oct. 20, 1919; record from May 1, 1920 to April 30, 1921.

Production: Milk, 10,731 lbs.; fat, 427.2 lbs.; test, 3.9 per cent.

Feed (lbs.): Pasture, 102 (days); silage, 9,020; hay, 1,547; grain, 2,651; stover, 500.

R. O. P. 1034—White Legs: Gr. Holstein; 4 yrs.; fresh Oct. 22, 1919 and Oct. 25, 1920; record from May 1, 1920 to April 30, 1921.

Production: Milk, 11,181 lbs.; fat, 413 lbs.; test, 3.7 per cent.

Feed (lbs.): Pasture, 112 (days); silage, 9,020; hay, 1,547; grain, 2,183; stover, 2,000.

Telfer, Frank M., Fort Atkinson

R. O. P. 664—Kathrine: Gr. Guernsey; 4 yrs.; fresh March 25, 1919 and Feb. 29, 1920; record from May 1, 1919 to April 30, 1920.

Production: Milk, 8,328 lbs.; fat, 386.6 lbs.; test 4.64 per cent.

Feed (lbs.): Pasture, 98 (days); silage, 6,610; hay, 1,668; grain, 1,554; corn fodder, \$1; green corn, \$3.50; stover, 900.

Yandry, Henry J., Fort Atkinson

R. O. P. 660—Lady Josephine Inka De Kol III, 233,509: Reg. Holstein; 5 yrs.; fresh Oct. 20, 1918 and Oct. 1, 1919; record from May 1, 1919 to April 30, 1920.

Production: Milk, 15,028 lbs.; fat, 458.4 lbs.; test, 3.05 per cent.

Feed (lbs.): Pasture, 139 (days); silage, 5,700; clover hay, 953; grain, 3,265; fodder, 300; green corn, \$2; stover, 1,500.

R. O. P. 661—Queen De Kol Rosa Bonhuer II, 234,433: Reg. Holstein; 5 yrs.; fresh Sept. 24, 1918 and Oct. 29, 1919; record from May 1, 1919 to April 30, 1920.

Production: Milk, 12,013 lbs.; fat, 381.4 lbs.; test, 3.17 per cent.

Feed (lbs.): Pasture, 139 (days); silage, 5,700; clover hay, 953; fodder, 300; grain, 2,533; green corn, \$2; stover, 1,500.

R. O. P. 662—Sissy Baker of Meadow Lawn 4th, 123,572: Reg. Holstein; 10 yrs.; fresh Oct. 17, 1918 and Dec. 15, 1919; record from May 1, 1919 to April 30, 1920.

Production: Milk, 11,119 lbs.; fat, 376.6 lbs.; test, 3.38 per cent.

Feed (lbs.): Pasture, 139 (days); silage, 5,700; clover hay, 953; grain, 2,276; fodder, 300; green corn, \$2; stover, 1,500.

R. O. P. 663—Sissy Baker of Meadow Lawn 5th, 160,730: Reg. Holstein; 8 yrs.; fresh Jan. 12, 1919 and Nov. 13, 1919; record from May 1, 1919 to April 30, 1920.

Production: Milk, 12,067 lbs.; fat, 401.7 lbs.; test, 3.32 per cent.

Feed (lbs.): Pasture, 139 (days); silage, 5,700; clover hay, 953; grain, 2,380; fodder, 300; stover, 1,500.

HOLMEN ASSOCIATION

Bymers, Garrett & Son, Holmen

R. O. P. 882—No. 8: Gr. Guernsey; 9 yrs.; fresh Oct. 19, 1920; record from March 1, 1919 to March 1, 1920.

Production: Milk, 9,208 lbs.; fat, 369.4 lbs.; test, 4.01 per cent.

Feed (lbs.): Pasture, 169 (days); silage, 7,640; hay, 1,568; corn stover, 450; grain, 1,980.

R. O. P. 883—No. 10: Gr. Guernsey; 6 yrs.; fresh Nov. 7, 1919; record from March 1, 1919 to March 1, 1920.

Production: Milk, 8,523 lbs.; fat, 375.9 lbs.; test, 4.41 per cent.

Feed (lbs.): Pasture, 169 (days); silage, 7,640; hay, 1,568; corn stover, 450; grain, 1,744.

R. O. P. 884—No. 17: Gr. Guernsey; 6 yrs.; fresh Nov. 17, 1919; record from March 1, 1919 to March 1, 1920.

Production: Milk, 10,165 lbs.; fat, 445.6 lbs.; test, 4.38 per cent.

Feed (lbs.): Pasture, 169 (days); silage, 7,640; hay, 1,568; corn stover, 450; grain, 1,920.

R. O. P. 1049—No. 6: Gr. Guernsey; 6 yrs.; fresh Oct. 31, 1919 and Nov. 6, 1920; record Oct. 31, 1919 to Nov. 6, 1920.

Production: Milk, 7,931 lbs.; fat, 409.7 lbs.; test, 5.16 per cent.

Feed (lbs.): Pasture, 215 (days); grain, 1,609; silage 6,300; hay, 1,680; corn stalks, 600.

Halverson, H. R., Holmen

R. O. P. 924—Spruce Lane's Elsie: Gr. Guernsey; 4 yrs.; fresh March 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 8,006 lbs.; fat, 381.2 lbs.; test, 4.76 per cent.

Feed (lbs.): Pasture, 167 (days); corn silage, 5,670; hay, 1,365; corn stover, 1,035; grain, 1,548.

Knudson, Emil, Holmen

R. O. P. 176b—Nanette of Seven Elms Farm, 50,239: Reg. Guernsey; 6 yrs.; fresh Dec. 17, 1919 and Dec. 11, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 7,068 lbs.; fat, 437.4 lbs.; test, 6.19 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 7,110; hay, 866; corn stover, 1,350; grain, 1,007.

R. O. P. 767—Nanette of Seven Elms Farm, 50,239: Reg. Guernsey; 5 yrs.; fresh Jan. 30, 1919 and Dec. 17, 1919; record from March 1, 1919 to March 1, 1920.

Production: Milk, 7,340 lbs.; fat, 426 lbs.; test, 5.8 per cent.

Feed (lbs.): Pasture, 172 (days); silage, 7,204; hay, 515; corn stover, 1,415; grain, 1,271.

Lee, Ludwig T., Holmen

R. O. P. 793—No. 6: Gr. Guernsey; 6 yrs.; fresh Nov. 25, 1918 and Nov. 19, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 8,450 lbs.; fat, 409.1 lbs.; test, 4.84 per cent.

Feed (lbs.): Pasture, 174 (days); silage, 6,020; hay, 1,040; corn stover, 800; grain, 1,347.

R. O. P. 793a—Julia No. 6: Gr. Guernsey; 7 yrs.; fresh Nov. 19, 1919 and Nov. 5, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 9,664 lbs.; fat, 469.1 lbs.; test, 4.85 per cent.

Feed (lbs.): Pasture, 171 (days); silage, 5,790; hay, 864; grain, 1,470; stover, 900.

R. O. P. 1050—Aggie No. 10: Gr. Guernsey; 8 yrs.; fresh Dec. 19, 1919 and Dec. 2, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 7,955 lbs.; fat, 370.7; test, 4.64 per cent.

Feed (lbs.): Pasture, 201 (days); silage, 5,790; hay, 864; stover, 1,050; grain, 1,640.

R. O. P. 1051—Betsy No. 21: Gr. Guernsey; 5 yrs.; fresh April 1, 1920 and Feb. 1, 1921; record from March 1, 1920 to March 1, 1921.

Production: Milk, 7,990 lbs.; fat, 367 lbs.; test, 4.59 per cent.

Feed (lbs.): Pasture, 171 (days); silage, 5,790; hay, 914; stover, 1,050; grain, 1,530.

Schaller, Geo. H., Holmen

R. O. P. 635—Bessie: Gr. Holstein; 8 yrs.; fresh Jan., 1918 and Feb. 15, 1919; record from March 1, 1919 to March 1, 1920.

Production: Milk, 10,691 lbs.; fat, 395.5 lbs.; test, 3.69 per cent.

Feed (lbs.): Pasture, 169 (days); silage, 8,250; hay, 510; corn stover, 1,360; grain, 1,651; oil meal, 90.

R. O. P. 636—Olive Canary Duchess, 180,207: Reg. Holstein; 6 yrs.; fresh Nov. —, 1918 and Nov. 5, 1919; record from March 1, 1919 to March 1, 1920.

Production: Milk, 11,214 lbs.; fat, 395.5 lbs.; test, 3.52 per cent.

Feed (lbs.): Pasture, 169 (days); silage, 8,250; hay, 510; corn stover, 1,360; grain, 2,311; oil meal, 90.

Skogen, Ernest L., Holmen

R. O. P. 1053—Johanna No. 2: Gr. Jersey; 8 yrs.; fresh Nov. 15, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 6,771 lbs.; fat, 386.7 lbs.; test, 5.91 per cent.

Feed (lbs.): Pasture, 172 (days); silage, 5,600; hay, 490; corn stover, 850; grain, 1,202.

R. O. P. 1054—Stella: Gr. Jersey; 6 yrs.; fresh Dec. 10, 1919 and Feb. —, 1921; record from March 1, 1920 to March 1, 1921.

Production: Milk, 6,951 lbs.; fat, 365.8 lbs.; test, 5.26 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 5,600; hay, 690; stover, 850; grain, 977.

Waldenberger, Henry, Midway

R. O. P. 1055—Baldy: Native; 8 yrs.; fresh Nov. 3, 1919 and Oct. 12, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 8,977 lbs.; fat, 408.6 lbs.; test, 3.66 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 5,160; hay, 600; stover, 1,200; grain, 2,604.

R. O. P. 1056—Bell: Native; 8 yrs.; fresh March 2, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 8,105 lbs.; fat, 373.7 lbs.; test, 4.60 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 5,160; hay, 600; stover, 1,200; grain, 2,124.

R. O. P. 1058—Jersey: Gr. Jersey; 10 yrs.; fresh Dec. 10, 1919 and Jan. 9, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 6,903 lbs.; fat, 411.3 lbs.; test, 5.95 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 5,160; hay, 600; stover, 1,200; grain, 2,124.

R. O. P. 1059—Lottie: Gr. Ayrshire; 6 yrs.; fresh Dec. 7, 1919 and Nov. 14, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 8,485 lbs.; fat, 368.9 lbs.; test, 4.35 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 5,160; hay, 600; stover, 1,200; grain, 2,424.

HORICON ASSOCIATION

Ulrich, Emil A., Horicon

R. O. P. 721—Dolly: Gr. Holstein; 6 yrs.; fresh Nov. 2, 1918 and Oct. 22, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 9,018 lbs.; fat, 375 lbs.; test, 4.16 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 6,161; alfalfa hay, 1,578; mixed feed, 2,065.

R. O. P. 722—Elsie: Gr. Holstein; 7 yrs.; fresh Sept. 25, 1918 and Oct. 4, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 10,502 lbs.; fat, 434.8 lbs.; test, 4.14 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 6,161; alfalfa hay, 1,578; mixed feed, 2,273.

R. O. P. 723—Glory: Gr. Holstein; 9 yrs.; fresh Nov. 16, 1918 and Oct. 7, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 10,339 lbs.; fat, 392 lbs.; test, 3.79 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 6,161; alfalfa hay, 1,578; mixed feed, 2,397.

R. O. P. 724—Jespie: Gr. Holstein; 7 yrs.; fresh Nov. 1, 1917 and May 9, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 11,340 lbs.; fat, 424.6 lbs.; test, 3.74 per cent.

Feed (lbs.): Pasture, 172 (days); silage, 6,161; alfalfa hay, 1,578; mixed feed, 1,638.

R. O. P. 725—Kate: Gr. Holstein; 6 yrs.; fresh Dec. 29, 1918; record from April 1, 1919 to April 1, 1920.

Production: Milk, 9,723 lbs.; fat, 423 lbs.; test, 4.35 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 6,161; alfalfa hay, 1,578; mixed feed, 1,829.

R. O. P. 726—Pet: Gr. Holstein; 10 yrs.; fresh Nov. 5, 1918 and Oct. 17, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 12,482 lbs.; fat, 390 lbs.; test, 3.12 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 6,161; alfalfa hay, 1,578; mixed feed, 2,664.

IOLA ASSOCIATION

Floistad, Knute, Iola

R. O. P. 479—Blackie: Gr. Holstein; 9 yrs.; fresh Jan. 20, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 8,602 lbs.; fat, 375.8 lbs.; test, 4.36 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 4,146; hay, 1,452; straw, 155; oats, 397; wheat feed, 59; oil meal, 76; corn, 119; marsh hay, 420.

R. O. P. 480—Star: Gr. Holstein; 7 yrs.; fresh Feb. 2, 1919 and Dec. 12, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 9,230 lbs.; fat, 365.1 lbs.; test, 3.95 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 4,146; hay, 1,452; straw, 155; oats, 277; wheat feed, 302; oil meal, 76; corn, 149; marsh hay, 991.

Gjertson, Geo. J., Iola

R. O. P. 481—Beauty: Gr. Guernsey; 12 yrs.; fresh Feb. 19, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 7,731 lbs.; fat, 407.3 lbs.; test, 5.2 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,549; hay, 1,098; marsh hay, 288; oats, 556; barley, 262; oil meal, 81; bran, 93; grain, 558.

Ince, F. A., Iola

R. O. P. 482—Johanna Daisy Theresa, 207,736: Reg. Holstein; 5 yrs.; fresh Jan. 5, 1918 and Sept. 1, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 10,305 lbs.; fat, 372.3 lbs.; test, 3.60 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 6,840; hay, 1,394; oats, 439; oil meal, 134; grain mixture, 1,274; bran, 136.

Jenson, L. J., Ogdensburg

R. O. P. 483—Big White Cow: Gr. Holstein; 5 yrs.; fresh Aug. 10, 1918 and Aug. 13, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk 16,630 lbs.; fat, 392.6 lbs.; test, 3.75 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 5,540; alfalfa hay, 1,590; barley, 281; oats, 129; Armour's, 932; grain mixture, 310.

R. O. P. 484—Iola: Gr. Holstein; 9 yrs.; fresh Oct. 4, 1918 and Oct. 29, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 12,101 lbs.; fat, 482.9 lbs.; test, 3.99 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 5,540; alfalfa hay, 1,590; barley, 397; oats, 179; Armour's dairy feed, 704; grain mixture, 620.

R. O. P. 485—Oak Farm: Gr. Holstein; 8 yrs.; fresh Nov. 22, 1918 and Nov. 19, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 12,300 lbs.; fat, 512.1 lbs.; test, 4.16 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 5,540; alfalfa hay, 1,590; barley, 423; oats, 277; Armour's, 724; grain mixture, 527.

Johnson, O. R., Iola

R. O. P. 486—Iola's Best: Gr. Holstein; 4 yrs.; fresh Jan. 27, 1919 and Nov. 27, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 8,233 lbs.; fat, 366.5 lbs.; test, 4.45 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 9,563; hay, 2,034; oats 220; gluten, 195; grain mixture, 1,068; oil meal, 26.

Larson, J. LeRoy, Iola

R. O. P. 487—Polly: Gr. Guernsey; 4 yrs.; fresh Feb. 20, 1919 and Jan. 2, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 7,835 lbs.; fat, 371.4 lbs.; test, 4.83 per cent.

Feed (lbs.): Pasture, 157 (days); silage 6,351; hay, 1,426; oats, 463; barley, 184; oil meal, 48.8; gluten, 108; grain mixture, 746.

Rowe, H. L., Scandinavia

R. O. P. 488—Sigre: Gr. Guernsey; 11 yrs.; fresh Jan. 26, 1918 and Jan. 11, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 7,015 lbs.; fat, 387.7 lbs.; test, 5.52 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 8,434; timothy hay, 1 476; marsh hay, 17; corn fodder, 34; straw, 488; grain mixture, 1,370.

R. O. P. 489—Violet: Gr. Guernsey; 5 yrs.; fresh Dec. 4, 1918 and Dec. 28, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 7,088 lbs.; fat, 381.3 lbs.; test, 5.37 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 8,434; timothy hay, 1,476; marsh hay, 17; corn fodder, 34; straw, 518; grain mixture, 1,566.

Sether, A. & Son, Iola

R. O. P. 490—Nettin: Gr. Guernsey; 6 yrs.; fresh Jan. 12, 1919 and Dec. 3, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 8,407 lbs.; fat, 427.5 lbs.; test, 5 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 5,503; hay, 1,923; grain mixture, 2,052; barley, 60; Armour's dairy feed, 90.

Tubaas, Ole, Iola

R. O. P. 491—Wisconsin Lass: Gr. Guernsey; 7 yrs.; fresh Nov. 27, 1918 and Nov. 14, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 8,611 lbs.; fat, 396.7 lbs.; test, 4.6 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 5,794; clover hay, 1,582; grain mixture, 1,275; oil meal, 167.

JUNEAU ASSOCIATION

Becker, W. A., Route 2, Juneau

R. O. P. 677—Joyce: Gr. Holstein; 5 yrs.; fresh Feb. 8, 1919 and Jan. 22, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 9,185 lbs.; fat, 373.3 lbs.; test, 3.8 per cent.

Feed (lbs.): Pasture, 164 (days); silage, 5,850; hay, 3,011; molasses, 94; grain, 2,792.

Bussewitz, W. E., Juneau

R. O. P. 678—Juneau Belle 6th, 379,117: Reg. Holstein; 2 yrs.; fresh Dec. 25, 1918 and Dec. 3, 1919; record from April 1, 1919 to March 31, 1920.

Production: Milk, 10,380 lbs.; fat, 366.7 lbs.; test, 3.57 per cent.

Feed (lbs.): Silage, 8,080; hay, 2,884; beets, 570; grain, 2,137.

R. O. P. 679—Pet Douglas 3d Johanna, 111,298: Reg. Holstein; 11 yrs.; fresh April —, 1918 and April 19, 1919; record from April 1, 1919 to March 31, 1920.

Production: Milk, 10,540 lbs.; fat, 371.6 lbs.; test, 3.7 per cent.

Feed (lbs.): Pasture, 165 (days); silage, 8,290; hay, 2,656; grain, 1,826.

R. O. P. 680—Jewel Piebe Estata De Kol, 260,024: Reg. Holstein; 5 yrs.; fresh March 18, 1918 and March 15, 1919; record from April 1, 1919 to March 31, 1920.

Production: Milk, 10,947 lbs.; fat, 390.2 lbs.; test, 3.4 per cent.

Feed (lbs.): Pasture, 165 (days); silage, 7,520; hay, 2,518; beets, 1,200; grain, 2,151.

Hasse, Louis E., Juneau

R. O. P. 681—Estata Hengerveld De Kol, 278,811: Reg. Holstein; 4 yrs.; fresh Oct. 3, 1918 and Oct. 13, 1919; record from April 1, 1919 to March 31, 1920.

Production: Milk, 12,810 lbs.; fat, 372.4 lbs.; test, 3.8 per cent.

Feed (lbs.): Pasture, 162 (days); silage, 5,086; hay, 2,965; beets, 1,920; grain, 2,587.

Indermuehle, Christian, Juneau

R. O. P. 682—Theresia Piebe De Kol 3d, 252,096: Reg. Holstein; 5 yrs.; fresh Sept. 18, 1919 and Jan. 10, 1920; record from April 1, 1919 to March 31, 1920.

Production: Milk, 10,480 lbs.; fat, 373.9 lbs.; test, 3.9 per cent.

Feed (lbs.): Pasture, 166 (days); silage, 6,432; hay, 2,280; grain, 2,605.

Kasten, Gustave, Juneau

R. O. P. 687—Alcartra Aaggie, 169,676: Reg. Holstein; fresh Oct. —, 1918 and Sept. 2, 1919; record from April 1, 1919 to March 31, 1920.

Production: Milk, 9,030 lbs.; fat, 365.4 lbs.; test, 4 per cent.

Feed (lbs.): Pasture, 164 (days); silage, 9,360; hay, 1,535; grain, 2,500.

- R. O. P. 688—Acartra Susie, 149,378:** Reg. Holstein; 8 yrs.; fresh Oct. —, 1918 and Oct. 31, 1919; record from April 1, 1919 to March 31, 1920.
Production: Milk, 9,900 lbs.; fat, 390.2 lbs.; test, 3.9 per cent.
Feed (lbs.): Pasture, 164 (days); silage, 9,360; hay, 1,706; grain, 2,346.
- R. O. P. 689—Lady Aaggie Claire, 386,918:** Reg. Holstein; 3 yrs.; fresh Feb. 28, 1919 and June 15, 1920; record from April 1, 1919 to March 31, 1920.
Production: Milk, 11,220 lbs.; fat, 378.1 lbs.; test, 3.4 per cent.
Feed (lbs.): Pasture, 164 (days); silage, 9,360; hay, 1,706; grain, 2,795.

Keel, Elmer A., Juneau

- R. O. P. 683—Mabel Rue De Kol 2d, 227,342:** Reg. Holstein; 5 yrs.; fresh Feb. —, 1918 and March 30, 1919; record from April 1, 1919 to March 31, 1920.
Production: Milk, 15,870 lbs.; fat, 543.2 lbs.; test, 3.4 per cent.
Feed (lbs.): Pasture, 165 (days); silage, 7,162; hay, 1,547; grain, 4,940.
- R. O. P. 684—Maid Alcartra, 307,168:** Reg. Holstein; 4 yrs.; fresh Nov. 13, 1918 and Nov. 22, 1919; record from April 1, 1919 to March 31, 1920.
Production: Milk, 10,330 lbs.; fat, 405.4 lbs.; test, 3.9 per cent.
Feed (lbs.): Pasture, 165 (days); silage, 7,062; hay, 1,699; grain, 2,781.
- R. O. P. 685—Jess:** Gr. Holstein; 6 yrs.; fresh Oct. 16, 1919; record from April 1, 1919 to March 31, 1920.
Production: Milk, 11,300 lbs.; fat, 426.8 lbs.; test, 3.8 per cent.
Feed (lbs.): Pasture, 165 (days); silage, 7,262; hay, 1,547; grain, 3,829.
- R. O. P. 686—Princess Mutual De Kol 4th, 180,214:** Reg. Holstein; 7 yrs.; fresh Aug. —, 1917 and Sept. 18, 1918; record from April 1, 1919 to March 31, 1920.
Production: Milk, 12,400 lbs.; fat, 430.1 lbs.; test, 3.5 per cent.
Feed (lbs.): Pasture, 165 (days); silage, 7,162; hay, 1,547; grain, 3,876.

Kuhlman Brothers, Lowell

- R. O. P. 690—Blanche Piebe 3d, 176,007:** Reg. Holstein; 7 yrs.; fresh Feb. —, 1918 and Jan. 10, 1920; record from April 1, 1919 to March 31, 1920.
Production: Milk, 9,760 lbs.; fat, 368.3 lbs.; test, 3.8 per cent.
Feed (lbs.): Pasture, 171 (days); silage, 8,846; hay, 1,839; stover, 515; grain, 2,958.
- R. O. P. 691—Lady Jane Wayne, 259,381:** Reg. Holstein; 4 yrs.; fresh Jan. 13, 1919 and March 24, 1920; record from April 1, 1919 to March 31, 1920.
Production: Milk, 10,540 lbs.; fat, 389.1 lbs.; test, 3.7 per cent.
Feed (lbs.): Pasture, 171 (days); silage, 8,846; hay, 1,839; stover, 666; grain, 2,843.
- R. O. P. 692—Wild Rose Alcartra, 125,413:** Reg. Holstein; 10 yrs.; fresh Jan. 10, 1919 and Jan. 10, 1920; record from April 1, 1919 to March 31, 1920.
Production: Milk, 10,670 lbs.; fat, 377.8 lbs.; test, 3.5 per cent.
Feed (lbs.): Pasture, 171 (days); silage, 8,846; hay, 1,783; stover, 515; grain, 3,230.

Sette, O. E., Juneau

- R. O. P. 693—Acartra Queen 2d, 178,482:** Reg. Holstein; 7 yrs.; fresh Jan. —, 1919 and Dec. 10, 1919; record from April 1, 1919 to March 31, 1920.
Production: Milk, 11,130 lbs.; fat, 428.2 lbs.; test, 3.8 per cent.
Feed (lbs.): Silage, 6,292; hay, 2,529; beet pulp, 170; molasses, 190; grain, 2,824.
- R. O. P. 694—Canary Alcartra of Bonnie Meade 2d, 171,019:** Reg. Holstein; 8 yrs.; fresh Dec. —, 1919 and Jan. 16, 1920; record from April 1, 1919 to March 31, 1920.
Production: Milk, 11,868 lbs.; fat, 405.8 lbs.; test, 3.4 per cent.
Feed (lbs.): Pasture, 153 (days); silage, 6,432; hay, 2,700; molasses, 160; grain, 2,940.
- R. O. P. 695—Magnet Fobes Homestead 2d, 273,262:** Reg. Holstein; 5 yrs.; fresh Nov. —, 1918 and Oct. 31, 1919; record from April 1, 1919 to March 31, 1920.
Production: Milk, 11,430 lbs.; fat, 381.6 lbs.; test, 3.4 per cent.
Feed (lbs.): Silage, 6,432; hay, 2,700; molasses, 160; grain, 3,136.

Vellema Brothers, Juneau

R. O. P. 696—Beauty: Reg. Holstein; 6 yrs.; fresh Sept. 3, 1918 and Oct. 6, 1919; record from April 1, 1919 to March 31, 1920.

Production: Milk, 12,331 lbs.; fat, 399.5 lbs.; test, 3.2 per cent.

Feed (lbs.): Pasture, 171 (days); silage, 8,468; hay, 1,795; stover, 328; molasses, 47; grain, 3,234.

R. O. P. 697—Black: Gr. Holstein; 4 yrs.; fresh Dec. —, 1918 and Jan. 18, 1920; record from April 1, 1919 to March 31, 1920.

Production: Milk, 11,300 lbs.; fat, 387.1 lbs.; test, 3.4 per cent.

Feed (lbs.): Pasture, 170 (days); silage, 8,468; hay, 1,825; stover, 328; molasses, 47; grain, 2,976.

R. O. P. 698—Lady Ormsby Fayne, 246,952: Reg. Holstein; 5 yrs.; fresh Sept. 29, 1918 and Sept. 2, 1919; record from April 1, 1919 to March 31, 1920.

Production: Milk, 10,745 lbs.; fat, 390.8 lbs.; test, 3.6 per cent.

Feed (lbs.): Pasture, 171 (days); silage, 8,468; hay, 1,825; stover, 328; molasses, 47; grain, 3,092.

R. O. P. 699—No. 20: Gr. Holstein; 7 yrs.; fresh July —, 1918 and June 1, 1919; record from April 1, 1919 to March 31, 1920.

Production: Milk, 9,480 lbs.; fat, 399.6 lbs.; test, 4.2 per cent.

Feed (lbs.): Pasture, 171 (days); silage, 8,468; hay, 1,825; stover, 328; molasses, 47; grain, 2,458.

R. O. P. 700—No. 30: Gr. Holstein; 5 yrs.; fresh Nov. —, 1918 and Dec. 8, 1919; record from April 1, 1919 to March 31, 1920.

Production: Milk, 10,150 lbs.; fat, 366.8 lbs.; test, 3.6 per cent.

Feed (lbs.): Pasture, 171 (days); silage, 8,468; hay, 1,825; molasses, 47; stover, 328; grain, 3,331.

R. O. P. 701—No. 38: Gr. Holstein; 6 yrs.; fresh July —, 1918 and Sept. 24, 1919; record from April 1, 1919 to March 31, 1920.

Production: Milk, 10,980 lbs.; fat, 430.4 lbs.; test, 3.6 per cent.

Feed (lbs.): Pasture, 171 (days); silage, 8,408; hay, 1,825; stover, 328; molasses, 47; grain, 3,079.

Volkmann, Mrs. M., Juneau

R. O. P. 671—Blanche Piebe 2d, 147,110: Reg. Holstein; 8 yrs.; fresh April 26, 1918 and May 23, 1919; record from April 1, 1919 to March 31, 1920.

Production: Milk, 10,630 lbs.; fat, 386.9 lbs.; test, 3.6 per cent.

Feed (lbs.): Pasture, 175 (days); silage, 7,851; hay, 2,614; molasses, 63; grain, 2,361.

R. O. P. 672—Breezy Crest Colanthe Alcartra, 334,169: Reg. Holstein; 3 yrs.; fresh Feb. 4, 1919 and Dec. 26, 1919; record from April 1, 1919 to March 31, 1920.

Production: Milk, 11,220 lbs.; fat, 403.7 lbs.; test, 3.6 per cent.

Feed (lbs.): Pasture, 155 (days); silage, 7,598; hay, 2,353; molasses, 63; grain, 3,084.

R. O. P. 673—Breezy Crest Colanthe Blanche, 326,158: Reg. Holstein; 4 yrs.; fresh Nov. 26, 1918 and Dec. 21, 1919; record from April 1, 1919 to March 31, 1920.

Production: Milk, 10,060 lbs.; fat, 379.5 lbs.; test, 3.8 per cent.

Feed (lbs.): Pasture, 155 (days); silage, 7,598; hay, 2,440; molasses, 63; grain, 2,622.

R. O. P. 674—Molly Douglas Alcartra, 143,472: Reg. Holstein; 9 yrs.; fresh March 31, 1919 and May 3, 1920; record from April 1, 1919 to March 31, 1920.

Production: Milk, 11,060 lbs.; fat, 401.6 lbs.; test, 3.6 per cent.

Feed (lbs.): Pasture, 155 (days); silage, 7,861; hay, 2,624; molasses, 55; grain, 2,433.

R. O. P. 675—Molly Douglas Alcartra 2d, 281,222: Reg. Holstein; 4 yrs.; fresh March 18, 1919 and May 7, 1920; record from April 1, 1919 to March 31, 1920.

Production: Milk, 12,170 lbs.; fat, 424.2 lbs.; test, 3.5 per cent.

Feed (lbs.): Pasture, 155 (days); silage, 7,861; hay, 2,624; molasses, 63; grain, 2,470.

R. O. P. 676—Princess Douglas De Kol, 229,433: Reg. Holstein; 6 yrs.; fresh May 21, 1918 and April 23, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 11,020 lbs.; fat, 388.4 lbs.; test, 3.5 per cent.

Feed (lbs.): Pasture, 155 (days); silage, 6,644; hay, 2,333; molasses, 63; grain, 2,514.

KIEL ASSOCIATION

Heckman Brothers, Route 1, Kiel

R. O. P. 1012—Lottie: Gr. Guernsey; 3 yrs.; fresh Jan. 1, 1920 and Dec. 27, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 6,906 lbs.; fat, 380.5 lbs.; test, 5.5 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 6,900; hay, 889; gluten, 2,475; molasses, 90.

R. O. P. 1013—Valley: Gr. Guernsey; 3 yrs.; fresh Aug. 30, 1919 and Nov. 7, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 9,239 lbs.; fat, 410.8 lbs.; test, 4.45 per cent.

Feed (lbs.): Pasture, 162 (days); silage, 6,900; hay, 889; gluten, 2,475; molasses, 90.

Koeser, Herman, Kiel

R. O. P. 1060—Beauty: Gr. Holstein; 3 yrs.; fresh March 1, 1920 and Jan. 8, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 10,689 lbs.; fat, 396.1 lbs.; test, 3.64 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 6,462; hay, 1,063; oil meal, 1,565.

R. O. P. 1061—Hickory Grove Nig, 235,905: Reg. Holstein; 6 yrs.; fresh Dec. 12, 1919 and Dec. 7, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 10,775 lbs.; fat, 437.8 lbs.; test, 4.06 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 6,462; hay, 1,063; oil meal, 1,565.

R. O. P. 1062—Nig Alcartra Canary, 338,602: Reg. Holstein; 3 yrs.; fresh Jan. 26, 1920 and Dec. 12, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 14,096 lbs.; fat, 544.1 lbs.; test, 3.7 per cent.

Feed (lbs.): Pasture, 162 (days); silage, 6,462; hay, 1,063; oil meal, 1,715.

R. O. P. 1063—Nig Alcartra Pontiac De Kol, 449,945: Reg. Holstein; 2 yrs.; fresh Jan. 6, 1920 and Dec. 20, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 9,489 lbs.; fat, 402.9 lbs.; test, 4.42 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 6,462; hay, 1,063; oil meal, 1,565.

R. O. P. 1064—Polly: Gr. Holstein; — yrs.; fresh Jan. 5, 1920 and Dec. 9, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 11,251 lbs.; fat, 416.9 lbs.; test, 3.6 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 6,462; hay, 1,063; oil meal, 1,715.

Kuhn, John, Elkhart Lake

R. O. P. 140b—Jack: Gr. Holstein; 7 yrs.; fresh Feb. 12, 1920 and March 15, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 9,944 lbs.; fat, 384.4 lbs.; test, 3.86 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 4,428; hay, 1,924; corn stover, 1,215; oil meal, 783.

R. O. P. 1065—Queen: Gr. Holstein; 4 yrs.; fresh Jan. 24, 1920 and Dec. 20, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 10,360 lbs.; fat, 375.5 lbs.; test, 3.6 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 4,428; hay, 1,889; corn stover, 1,215; oil meal, 1,226.

Mayr, Arthur, Route 1, Kiel

R. O. P. 1066—Bless: Gr. Holstein; — yrs.; fresh ———; record from April 1, 1920 to April 1, 1921.

Production: Milk, 10,421 lbs.; fat, 401.9 lbs.; test, 3.85 per cent.

Feed (lbs.): Pasture, 152 (days); silage, 6,220; hay, 480; oil meal, 1,448; ground corn, 460.

R. O. P. 1067—Dora: Gr. Guernsey; — yrs.; fresh ———; record from April 1, 1920 to April 1, 1921.

Production: Milk, 10,005 lbs.; fat, 417.4 lbs.; test, 4.17 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,220; hay, 480; Stevens' 44, 1,466; molasses, 472.

R. O. P. 1068—Flammy: Gr. Guernsey; — yrs.; fresh ———; record from April 1, 1920 to April 1, 1921.

Production: Milk, 13,792 lbs.; fat, 529.9 lbs.; test, 4.3 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,220; hay, 2,616; oil meal, 4,016; ground corn, 580.

R. O. P. 1069—Golden Ella of Cedar Grove, 66,753: Reg. Guernsey; 5 yrs.; fresh Feb. 27, 1919 and May 13, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 12,676 lbs.; fat, 667 lbs.; test, 5.22 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 4,720; hay, 2,386; Stevens' 44, 3,666; molasses, 600.

R. O. P. 1070—Lulu: Gr. Holstein; — yrs.; fresh ———; record from April 1, 1920 to April 1, 1921.

Production: Milk, 11,144 lbs.; fat, 395.6 lbs.; test, 3.54 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,220; hay, 480; Stevens' 44, 1,466.

Meiselwitz, A. F., Kiel

R. O. P. 588a—Bessie: Gr. Guernsey; 5 yrs.; fresh Jan. 11, 1920 and Dec. 16, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 8,050 lbs.; fat, 442.8 lbs.; test, 5.5 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,160; hay, 1,699; barley, 1,893.

R. O. P. 1071—Beauty: Gr. Holstein; 8 yrs.; fresh Jan. 10, 1920 and Dec. 24, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 9,960 lbs.; fat, 397.5 lbs.; test, 3 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,160; hay, 1,637; corn stover, 838; oil meal, 1,023; barley, 413.

R. O. P. 1072—Fan: Gr. Holstein; 4 yrs.; fresh Feb. 9, 1920 to Jan. 1, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 11,799 lbs.; fat, 457.6 lbs.; test, 3 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,160; hay, 1,637; corn stover, 1,162; oil meal, 1,736.

Mueller, Edgar C., Route 2, Kiel

R. O. P. 1073—Lizzie: Gr. Holstein; 7 yrs.; fresh April 4, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 10,708 lbs.; fat, 396.4 lbs.; test, 3.7 per cent.

Feed (lbs.): Silage, 6,110; hay, 1,281; bran, 619.

R. O. P. 1074—Meeme: Gr. Holstein; 4 yrs.; fresh ———; record from April 1, 1920 to April 1, 1921.

Production: Milk, 12,725 lbs.; fat, 455.5 lbs.; test, 3.59 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 6,110; hay, 1,236; oil meal, 974.

Platz, Leonard Jr., Elkhart Lake

R. O. P. 1075—Lily Bell of Silent Valley, 61,357: Reg. Guernsey; 4 yrs.; fresh March 27, 1920 and March 4, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 7,685 lbs.; fat, 431.7 lbs.; test, 5.6 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 6,304; corn stover, 876; oil meal, 790.

Raquet, Chas., Route 2, Kiel

R. O. P. 591a—Brindle: Gr. Holstein; 8 yrs.; fresh Oct. 25, 1919 and Oct. 23, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 10,481 lbs.; fat, 405.5 lbs.; test, 3.78 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,740; hay, 728; corn stover, 1,098; gluten, 1,001; oil meal, 400.

R. O. P. 592a—Johanna: Gr. Holstein; 5 yrs.; fresh Dec. 11, 1919 and Dec. 21, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 9,234 lbs.; fat, 413.9 lbs.; test, 4.59 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,765; hay, 728; corn stover, 1,335; oil meal, 1,541.

R. O. P. 1076—Blossom: Gr. Holstein; 4 yrs.; fresh March 8, 1920 and Feb. 1, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 9,859 lbs.; fat, 403 lbs.; test, 4.09 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,740; hay, 738; corn stover, 1,284; oil meal, 974.

R. O. P. 1077—Dolly: Gr. Holstein; — yrs.; fresh April 14, 1920 and Feb. 21, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 8,510 lbs.; fat, 407 lbs.; test, 4.78 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,275; hay, 683; corn stover, 1,098; oil meal, 652.

Schmidt, Arvin, Kiel

R. O. P. 1078—Susie: Gr. Guernsey; 9 yrs.; fresh Dec. 19, 1919 and Jan. 9, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 7,885 lbs.; fat, 366.2 lbs.; test, 4.64 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,120; hay, 1,169; corn stover, 1,072.

Schneider, Joseph Jr., Kiel

R. O. P. 1079—Betsy Duchess, 168,497: Reg. Holstein; 10 yrs.; fresh Oct. 24, 1919 and Nov. 11, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 10,988 lbs.; fat, 396.1 lbs.; test, 3.66 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,790; hay, 1,700; corn stover, 720; oats, 1,514.

R. O. P. 1080—Betsy Duchess 2d, 247,398: Reg. Holstein; 6 yrs.; fresh Nov. 12, 1919 and Oct. 28, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 9,750 lbs.; fat, 388.8 lbs.; test, 3.98 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,790; hay, 1,700; corn stover, 720; oats, 1,432.

R. O. P. 1081—Nora Segis Spofford, 283,557: Reg. Holstein; 5 yrs.; fresh Jan. 3, 1920 and Dec. 15, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 9,886 lbs.; fat, 370.9 lbs.; test, 3.75 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,740; hay, 1,100; corn stover, 1,500; oats, 903.

Schotte, Charles, Route 5, Antigo

R. O. P. 1084—Francise: Gr. Jersey; 3 yrs.; fresh Jan. 28, 1920 and Feb. 6, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 7,074 lbs.; fat, 383.6 lbs.; test, 5.42 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 4,891; hay, 1,917; rutabagas, 780; grain, 1,011.

R. O. P. 1091—Kate: Gr. Jersey; 3 yrs.; fresh March 28, 1919 and April 20, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 7,394 lbs.; fat, 504.2 lbs.; test, 6.95 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 5,108; hay, 1,917; rutabagas, 780; grain, 1,039.

Th'elke, F. F. & Son, Route 2, Kiel

R. O. P. 77a—Primrose of Schleswig 2d, 26,500: Reg. Guernsey; 11 yrs.; fresh Nov. 2, 1917 and Sept. 16, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 6,195 lbs.; fat, 396.7 lbs.; test, 6.4 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 4,800; hay, 2,758; corn stover, 1,800; oil meal, 1,644; molasses, 75.

R. O. P. 78a—Dairy Maid of Louis Corners, 45,320: Reg. Guernsey; 9 yrs.; fresh Oct. 9, 1919 and Oct. 1, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 8,314 lbs.; fat, 415.7; test, 5 per cent.

Feed (lbs.): Pasture, 161 (days); silage, 4,740; hay, 2,798; corn stover, 1,800; oil meal, 1,719; molasses, 226.

R. O. P. 594a—Alice of Louis Corners, 64,828: Reg. Guernsey; 4 yrs.; fresh Jan. 2, 1920 and Dec. 13, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 9,861 lbs.; fat, 610.3 lbs.; test, 6.9 per cent.

Feed (lbs.): Pasture, 161 (days); silage, 4,800; hay, 2,640; corn stover, 1,200; oil meal, 2,221; molasses, 226.

R. O. P. 597a—Elsie of Louis Corners, 64,827: Reg. Guernsey; 4 yrs.; fresh Nov. 1, 1919 and Nov. 1, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 7,509 lbs.; fat, 373.5 lbs.; test, 4.9 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 4,800; hay, 2,570; corn stover, 1,200; gluten, 1,779; molasses, 226.

R. O. P. 600a—Primrose Maid of Louis Corners, 67,052: Reg. Guernsey; 4 yrs.; fresh Jan. 1, 1920 and Dec. 1, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 9,991 lbs.; fat, 445.5 lbs.; test, 4.46 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 4,800; hay, 2,180; corn stover, 1,200; oil meal, 1,979; molasses, 196.

R. O. P. 601a—Violet of Louis Corners, 73,466: Reg. Guernsey; 3 yrs.; fresh Dec. 13, 1920 and Jan. 21, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 8,137 lbs.; fat, 448.6 lbs.; test, 5.51 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 4,740; hay, 2,048; corn stover, 1,200; oil meal, 1,497; molasses, 226.

R. O. P. 1082—Brindle: Gr. Guernsey; 12 yrs.; fresh Aug. 14, 1919 and Sept. 5, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 7,554 lbs.; fat, 385.9 lbs.; test, 5.1 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 4,806; hay, 2,930; grain mixture, 1,463; molasses, 226.

R. O. P. 1083—Evelyn of Louis Corners, 84,780: Reg. Guernsey; 2 yrs.; fresh Jan. 11, 1920 and Dec. 7, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 8,789 lbs.; fat, 511.3 lbs.; test, 5.8 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 4,800; hay, 2,180; corn stover, 1,200; oil meal, 2,047; molasses, 226.

Voland, Fred H., Kiel

R. O. P. 1086—Brindle Johanna De Kol, 130,457: Reg. Holstein; 11 yrs.; fresh April 4, 1920 and March 5, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 11,282 lbs.; fat, 393.4 lbs.; test, 3.49 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 4,566; hay, 842; straw, 900; gluten, 547.

R. O. P. 1087—Jessie Maximus Johanna De Kol 2d, 304,874: Reg. Holstein; 5 yrs.; fresh Oct. 3, 1919 and Oct. 1, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 11,763 lbs.; fat, 478.7 lbs.; test, 4 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 4,632; hay, 842; straw, 900; oil meal, 1,722.

R. O. P. 1088—Laura Johanna Inka, 304,872: Reg. Holstein; 5 yrs.; fresh Feb. 17, 1920 and Jan. 1, 1921; record from April 1, 1920 to April 1, 1921.

Production: Milk, 11,014 lbs.; fat, 377.7 lbs.; test, 3.43 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 4,632; hay, 842; straw, 900; oil meal, 1,303; corn, 27.

R. O. P. 1089—Malay Johanna Messenger, 150,876: Reg. Holstein; 10 yrs.; fresh March 3, 1920 and ———; record from April 1, 1920 to April 1, 1921.

Production: Milk, 12,060 lbs.; fat, 412.5 lbs.; test, 3.42 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 4,570; hay, 842; straw, 900; oil meal, 1,146.

R. O. P. 1090—Susie: Gr. Holstein; 6 yrs.; fresh Jan. 27, 1920 and Dec. 14, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 11,026 lbs.; fat, 425.4 lbs.; test, 3.86 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 4,632; hay, 842; straw, 900; oil meal, 1,362.

LEON VALLEY ASSOCIATION

Daulton, Elmer, Melvina

R. O. P. 1160—Ruth: Gr. Holstein; 7 yrs.; fresh Jan. 2, 1920 and Nov. 8, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 9,180 lbs.; fat, 401.1 lbs.; test, 4.37 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 7,950; hay, 1,100; corn stover, 560; alfalfa, 360.

Gamble, Ray A., Sparta

R. O. P. 1161—Dandy: Gr. Guernsey; 7 yrs.; fresh Dec. 2, 1919 and Nov. 12, 1920; record from April 15, 1920 to April 15, 1921.

Production: Milk, 7,485 lbs.; fat, 406.6 lbs.; test, 5.43 per cent.

Feed (lbs.): Pasture, 194 (days); silage, 4,200; hay, 1,390; corn stover, 955.

R. O. P. 1162—Fly: Gr. Guernsey; 6 yrs.; fresh April 8, 1920 and March 15, 1921; record from April 15, 1920 to April 15, 1921.

Production: Milk, 7,955 lbs.; fat, 427.3 lbs.; test, 5.37 per cent.

Feed (lbs.): Pasture, 194 (days); silage, 4,200; mixed hay, 1,390; corn stover, 955.

R. O. P. 1163—Jessie: Gr. Guernsey; 7 yrs.; fresh Dec. 28, 1919 and Dec. 10, 1920; record from April 15, 1920 to April 15, 1921.

Production: Milk, 7,542 lbs.; fat, 394.1 lbs.; test, 5.23 per cent.

Feed (lbs.): Pasture, 194 (days); silage, 4,200; hay, 1,390; corn stover, 955.

R. O. P. 1164—Nancy: Gr. Guernsey; 2 yrs.; fresh Jan. 1, 1920 and Dec. 22, 1920; record from April 15, 1920 to April 15, 1921.

Production: Milk, 8,326 lbs.; fat, 373.7 lbs.; test, 4.49 per cent.

Feed (lbs.): Pasture, 194 (days); silage, 4,200; mixed hay, 1,390; corn stover, 955.

R. O. P. 1165—Trixie: Gr. Guernsey; 4 yrs.; fresh Sept. 25, 1919 and Sept. 15, 1920; record from April 15, 1920 to April 15, 1921.

Production: Milk, 9,493 lbs.; fat, 435.1 lbs.; test, 4.58 per cent.

Feed (lbs.): Pasture, 194 (days); silage, 4,200; hay, 1,390; corn stover, 955.

Muehlenkamp, Ben, Sparta

R. O. P. 1092—Bessie: Gr. Guernsey; 4 yrs.; fresh Sept. 17, 1919 and Oct. 10, 1920; record from May 1, 1920 to May 1, 1921.

Production: Milk, 7,734 lbs.; fat, 370.4 lbs.; test, 4.79 per cent.

Feed (lbs.): Pasture, 198 (days); corn silage, 4,140; alfalfa hay, 1,275; mixed hay, 540; corn stover, 200; straw, 180; grain, 1,822.

R. O. P. 1093—Boogey: Gr. Guernsey; 4 yrs.; fresh Feb. 15, 1920 and Jan. 21, 1921; record from May 1, 1920 to May 1, 1921.

Production: Milk, 7,787 lbs.; fat, 369 lbs.; test, 4.74 per cent.

Feed (lbs.): Pasture, 188 (days); corn silage, 4,220; alfalfa hay, 895; mixed hay, 546; oat straw, 670; grain, 1,677.

R. O. P. 1094—Bossy: Gr. Guernsey; 5 yrs.; fresh Nov. 28, 1919 and Nov. 7, 1920; record from May 1, 1920 to May 1, 1921.

Production: Milk, 8,662 lbs.; fat, 398.1 lbs.; test, 4.6 per cent.

Feed (lbs.): Pasture, 188 (days); corn silage, 4,290; alfalfa hay, 1,485; mixed hay, 180; corn stover, 200; straw, 180; grain, 1,647.

R. O. P. 1095—Sleepy: Gr. Guernsey; 4 yrs.; fresh Sept. 2, 1919 and Sept. 29, 1920; record from May 1, 1920 to May 1, 1921.

Production: Milk, 8,536 lbs.; fat, 431.6 lbs.; test, 5.06 per cent.

Feed (lbs.): Pasture, 188 (days); corn silage, 4,140; mixed hay, 540; alfalfa hay, 1,125; corn stover, 200; straw, 300; oil meal, 90; grain, 1,750.

R. O. P. 1096—Spunky: Gr. Guernsey; 5 yrs.; fresh Nov. 21, 1919 and Oct. 17, 1920; record from May 1, 1919 to May 1, 1920.

Production: Milk, 8,602 lbs.; fat, 392.7 lbs.; test, 4.57 per cent.

Feed (lbs.): Pasture, 188 (days); corn silage, 4,220; alfalfa hay, 1,275; mixed hay, 540; corn stover, 200; straw, 180; grain, 1,852.

R. O. P. 1097—Stubb: Gr. Guernsey; 3 yrs.; fresh Sept. 15, 1919 and Oct. 1, 1920; record from May 1, 1920 to May 1, 1921.

Production: Milk, 7,625 lbs.; fat, 371.5 lbs.; test, 4.87 per cent.

Feed (lbs.): Pasture, 188 (days); corn silage, 3,840; mixed hay, 690; alfalfa, 1,125; corn stover, 200; oat straw, 180; oats and barley, 210; oil meal, 105; grain, 1,775.

Schwarz, M. E., Sparta

R. O. P. 1166—Bessie: Gr. Guernsey; 6 yrs.; fresh April 24, 1920 and May 19, 1921; record from May 1, 1920 to May 1, 1921.

Production: Milk, 8,434 lbs.; fat, 373.3 lbs.; test, 4.43 per cent.

Feed (lbs.): Pasture, 183 (days); corn silage, 5,250; clover hay, 2,030; linseed oil meal, 241; oats and bran, 2,205.
Slayton, Chas. S., Sparta

R. O. P. 1167—Flossy: Gr. Guernsey; 9 yrs.; fresh March 27, 1920; record from April 15, 1920 to April 15, 1921.

Production: Milk, 7,841 lbs.; fat, 409.1 lbs.; test, 5.22 per cent.

Feed (lbs.): Pasture, 194 (days); silage, 5,160; mixed hay, 1,410; corn stover, 300; grain, 1,440.

R. O. P. 1168—Grace: Native, 5 yrs.; fresh Dec. 10, 1919 and Dec. 25, 1920; record from April 15, 1920 to April 15, 1921.

Production: Milk, 7,283 lbs.; fat, 404.8 lbs.; test, 5.56 per cent.

Feed (lbs.): Pasture, 194 (days); silage, 4,890; hay, 1,470; corn stover, 300; grain, 1,605.

LEOPOLIS TILLEDA ASSOCIATION

Brunner, F. X., Leopolis

R. O. P. 459—Johanna: Gr. Holstein; 4 yrs.; fresh March 14, 1919; record from Jan. 27, 1919 to Jan. 27, 1920.

Production: Milk, 9,544 lbs.; fat, 406 lbs.; test, 4.25 per cent.

Feed (lbs.): Pasture, 60 (days); silage, 10,200; hay, 1,510; bran, 390; middlings, 902.

R. O. P. 460—Lily: Native; 8 yrs.; fresh Jan. 14, 1918 and Jan. 4, 1920; record from Jan. 27, 1919 to Jan. 27, 1920.

Production: Milk, 9,050 lbs.; fat, 374.9 lbs.; test, 4.14 per cent.

Feed (lbs.): Pasture, 60 (days); silage, 10,500; hay, 1,510; bran, 600; balanced ration, 1,232.

R. O. P. 461—Queen: Native; 9 yrs.; fresh Jan. 19, 1919 and Nov. 26, 1920; record from Jan. 27, 1919 to Jan. 27, 1920.

Production: Milk, 10,299 lbs.; fat, 458.2 lbs.; test, 4.45 per cent.

Feed (lbs.): Pasture, 60 (days); silage, 11,400; hay, 1,510; bran, 840; middlings, 1,260.

Hohn, E. A., Lyndhurst

R. O. P. 462—Bessie: Gr. Holstein; 6 yrs.; fresh Dec. 1, 1918; record from Feb. 12, 1919 to Feb. 12, 1920.

Production: Milk, 10,689 lbs.; fat, 483.6 lbs.; test, 4.52 per cent.

Feed (lbs.): Pasture, 60 (days); silage, 4,776; hay, 920; alfalfa, 496; barley, 300; oats, 480; bran, 560.

R. O. P. 463—Daisy: Gr. Holstein; 5 yrs.; fresh Dec. —, 1918; record from Feb. 12, 1919 to Feb. 12, 1920.

Production: Milk, 8,830 lbs.; fat, 422.5 lbs.; test, 4.78 per cent.

Feed (lbs.): Pasture, 60 (days); silage, 3,576; hay, 920; alfalfa, 496; barley, 240; oats, 480; bran, 800.

Steff, Frank, Tilleda

R. O. P. 464—Agnes S., 7,476: Reg. Brown Swiss 5 yrs.; fresh April 4, 1918 and May 22, 1919; record from Jan. 7, 1919 to Jan. 7, 1920.

Production: Milk, 7,797 lbs.; fat, 379.1 lbs.; test, 4.83 per cent.

Feed (lbs.): Pasture, 60 (days); silage, 6,640; hay, 1,592; chaff, 651; oats, 496; ration, 450; roots, 660.

R. O. P. 465—Bessie S., 7,473: Reg. Brown Swiss; 7 yrs.; fresh April 20, 1918 and Aug. 3, 1919; record from Jan. 7, 1919 to Jan. 7, 1920.

Production: Milk, 8,133 lbs.; fat, 368 lbs.; test, 4.52 per cent.

Feed (lbs.): Pasture, 60 (days); silage, 6,640; hay, 1,592; chaff, 868; oats, 496; ration, 450; roots, 450.

R. O. P. 466—Clara S., 7,477: Reg. Brown Swiss; 8 yrs.; fresh Aug. 28, 1918 and Oct. 26, 1919; record from Jan. 7, 1919 to Jan. 7, 1920.

Production: Milk, 7,937 lbs.; fat, 370.8 lbs.; test, 4.67 per cent.

Feed (lbs.): Pasture, 60 (days); silage, 8,380; hay, 1,890; chaff, 1,085; oats, 496; ration, 150; roots, 450.

R. O. P. 467—Tillie S., 7,481: Reg. Brown Swiss; 4 yrs.; fresh April 5, 1918 and June 3, 1919; record from Jan. 7, 1919 to Jan. 7, 1920.

Production: Milk, 8,462 lbs.; fat, 453.8 lbs.; test, 5.36 per cent.

Feed (lbs.): Pasture, 60 (days); silage, 6,640; hay, 1,592; chaff, 868; oats, 496; ration, 450; roots, 450.

LINCOLN COUNTY ASSOCIATION

Rupprecht, L., Merrill

R. O. P. 729—Eminent Majesty's Daisy, 407,995: Reg. Jersey; 2 yrs.; fresh Jan. 3, 1920 and Sept. 21, 1920; record from Oct. 10, 1919 to Oct. 10, 1920.

Production: Milk, 6,217 lbs.; fat, 367.5 lbs.; test, 5.9 per cent.

Feed (lbs.): Pasture, 152 (days); silage, 3,983; hay, 1,756; bran, 608; barley, 102; oil meal, 186; bagas, 80; corn meal, 77; sugar beets, 30.

R. O. P. 730—Eminent Majesty's Princess, 391,796: Reg. Jersey; 4 yrs.; fresh Dec. 5, 1919 and Nov. 15, 1920; record from Oct. 10, 1919 to Oct. 10, 1920.

Production: Milk, 8,114 lbs.; fat, 445.3 lbs.; test, 5.49 per cent.

Feed (lbs.): Pasture, 182 (days); silage, 4,076; hay, 1,756; bran, 729; barley, 142; oil meal, 303; gluten, 32; corn meal, 45; sugar beets, 30.

R. O. P. 731—Lyons Dolly, 276,600: Reg. Jersey; 9 yrs.; fresh Aug. 30, 1919 and Aug. 22, 1920; record from Oct. 15, 1919 to Oct. 15, 1920.

Production: Milk, 7,938 lbs.; fat, 402.5 lbs.; test, 5.1 per cent.

Feed (lbs.): Pasture, 151 (days); silage, 4,166; hay, 1,756; bran, 837; barley, 190; oil meal, 273; bagas, 100; gluten, 32; corn meal, 30; sugar beets, 30.

R. O. P. 732—Raleigh Brown Queen, 348,443: Reg. Jersey; 6 yrs.; fresh Sept. 7, 1919 and Aug. 28, 1920; record from Oct. 15, 1919 to Oct. 15, 1920.

Production: Milk, 6,275 lbs.; fat, 370.5 lbs.; test, 5.9 per cent.

Feed (lbs.): Pasture, 152 (days); silage, 4,076; hay, 1,636; bagas, 45; bran, 776; barley, 190; oil meal, 293; gluten, 32; corn meal, 15.

R. O. P. 733—Raleigh Recorder's Queen, 330,553: Reg. Jersey; 6 yrs.; fresh Oct. 30, 1919; record from Oct. 15, 1919 to Oct. 15, 1920.

Production: Milk, 7,830 lbs.; fat, 480.5 lbs.; test, 6.1 per cent.

Feed (lbs.): Pasture, 152 (days); silage, 4,076; hay, 1,556; bran, 759; barley, 190; oil meal, 333; gluten, 32; corn meal, 45; sugar beets, 31.

LUCK MILLTOWN ASSOCIATION

Hanson, N. L., Route 3, Milltown

R. O. P. 829—Daisy: Gr. Guernsey; 7 yrs.; fresh Dec. 29, 1919 and Jan. 8, 1921; record from Jan. 1, 1919 to Jan. 1, 1920.

Production: Milk, 8,155 lbs.; fat, 395.7 lbs.; test, 4.85 per cent.

Feed (lbs.): Pasture, 169 (days); corn silage, 5,198; hay, 1,415; straw, 455; sugar cane, 530; mixed grain, 1,584.

MARSHALL ASSOCIATION

Peck, M. F. & Sons, Marshall

R. O. P. 98—Queen Johanna Lula, 150,723: Reg. Holstein; 7 yrs.; fresh Dec. 24, 1916 and Dec. 27, 1917; record from June 17, 1917 to June 17, 1918.

Production: Milk, 13,032 lbs.; fat, 387.1 lbs.; test, 2.97 per cent.

Feed (lbs.): Pasture, 153 (days); clover hay, 2,626; corn silage, 8,678; grain mixture, 2,347; green corn, 600; mangles, 1,230; corn fodder, 600; marsh hay, 155.

R. O. P. 99—Baker Mercedes 2d, 212,519: Reg. Holstein; 4 yrs.; fresh Oct. 7, 1916 and Sept. 9, 1917; record from June 17, 1917 to June 17, 1918.

Production: Milk, 11,873 lbs.; fat, 389.8 lbs.; test, 3.29 per cent.

Feed (lbs.): Pasture, 153 (days); clover hay, 2,626; corn silage, 8,678; grain mixture, 2,165; green corn, 600; mangles, 2,120; marsh hay, 155.

R. O. P. 100—Heilo Segis Inka, 162,037: Reg. Holstein; 6 yrs.; fresh Oct. 19, 1916; record from June 17, 1917 to June 17, 1918.

Production: Milk, 10,748 lbs.; fat, 395.3 lbs.; test, 3.68 per cent.

Feed (lbs.): Pasture, 153 (days); clover hay, 2,626; silage, 8,678; grain mixture, 2,209; green corn, 600; mangles, 2,120; corn fodder, 600; marsh hay, 155.

White, Lewis C., Marshall

R. O. P. 87—Colanthus De Kol: Gr. Holstein; 7 yrs.; fresh Dec. 31, 1916 and Dec. 25, 1917; record from June 1, 1917 to June 1, 1918.

Production: Milk, 11,431 lbs.; fat, 406.1 lbs.; test, 3.55 per cent.

Feed (lbs.): Pasture, 188 (days); clover hay, 1,866; corn silage, 6,960; oats, 553; bran, 797; oil meal, 106; Int. dairy feed, 65; C. S. meal, 177; screenings, 60.

R. O. P. 88—Black Beauty: Gr. Holstein; 7 yrs.; fresh Oct. 12, 1916 and Oct. 11, 1917; record from June 1, 1917 to June 1, 1918.

Production: Milk, 13,796 lbs.; fat, 485.8 lbs.; test, 3.52 per cent.

Feed (lbs.): Pasture, 188 (days); clover hay, 1,866; corn silage, 6,960; oats, 683; bran, 677; oil meal, 45; Int. dairy feed, 135; C. S. meal, 217; screenings, 60.

R. O. P. 89—Lady White: Gr. Holstein; 7 yrs.; fresh Sept. 19, 1916; record from June 1, 1917 to June 1, 1918.

Production: Milk, 8,442 lbs.; fat, 387.7 lbs.; test, 4.6 per cent.

Feed (lbs.): Pasture, 188 (days); clover hay, 1,866; silage, 6,960; oats, 652; bran, 897; oil meal, 68; Int. dairy feed, 180; C. S. meal, 217; screenings, 60.

R. O. P. 90—Flossie Gertrude De Kol, 251,130: Reg. Holstein; 5 yrs.; fresh Jan. 11, 1917 and Nov. 9, 1917; record from June 1, 1917 to June 1, 1918.

Production: Milk, 11,718 lbs.; fat, 396.9 lbs.; test, 3.38 per cent.

Feed (lbs.): Pasture, 188 (days); clover hay, 1,866; silage, 6,960; oats, 683; bran, 927; oil meal, 101; Int. dairy feed, 105; cottonseed meal, 217; screenings, 60.

NEW FRANKEN BROWN ASSOCIATION

Brunner, Joe Jr., Route 1, New Franken

R. O. P. 503—No. 10 Daisy: Gr. Holstein; 8 yrs.; fresh April 11, 1918 and April 21, 1919; record from March 30, 1919 to March 30, 1920.

Production: Milk, 12,259 lbs.; fat, 491.4 lbs.; test, 4 per cent.

Feed (lbs.): Pasture, 162 (days); silage, 8,094; clover hay, 3,121; arcade feed, 510; wheat bran, 1,248; green oats, 185; green corn fodder, 640; green barley, 165; mixed feeds, 804.

R. O. P. 504—No. 5 Flossie: Gr. Holstein; 6 yrs.; fresh Feb. 10, 1919 and Jan. 13, 1920; record from March 30, 1919 to March 30, 1920.

Production: Milk, 10,836 lbs.; fat, 410.5 lbs.; test, 3.79 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 8,152; clover hay, 3,096; arcade feed, 367; wheat bran, 168; green oats, 30; green barley, 165; mixed feed, 1,362; corn stover, 50.

R. O. P. 505—No. 11 Rosy: Native; 11 yrs.; fresh April 15, 1918 and March 25, 1919; record from March 30, 1919 to March 30, 1920.

Production: Milk, 9,211 lbs.; fat, 418.7 lbs.; test, 4.55 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 7,612; clover hay, 3,255; arcade feed, 480; wheat bran, 894; green oats, 185; green corn fodder, 640; green barley, 137; mixed feed, 574.

R. O. P. 506—No. 12 Spotty: Gr. Holstein; 6 yrs.; fresh April 27, 1918 and April 9, 1919; record from March 30, 1919 to March 30, 1920.

Production: Milk, 10,398 lbs.; fat, 416.5 lbs.; test, 4.01 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 7,985; clover hay, 2,940; arcade feed, 480; wheat bran, 931; green oats, 185; green corn fodder, 640; green barley, 110; mixed feed, 561.

Burkart, Valentine, Route 2, New Franken

R. O. P. 507—Ringo No. 11: Gr. Guernsey; 7 yrs.; fresh April 26, 1918 and Oct. 19, 1919; record from March 21, 1919 to March 21, 1920.

Production: Milk, 7,405 lbs.; fat, 404.1 lbs.; test, 5.46 per cent.

Feed (lbs.): Pasture, 186 (days); silage, 7,152; mixed hay, 3,152; green barley, 298; green oats, 193; wheat bran, 1,040; mixed feeds, 270. Craanen, Jacob Jr., Route 2, New Franken

R. O. P. 508—Fanny No. 3: Gr. Guernsey; 4 yrs.; fresh Dec. 28, 1919 and Nov. 17, 1920; record from March 29, 1919 to March 29, 1920.

Production: Milk, 7,703 lbs.; fat, 373.7 lbs.; test, 4.85 per cent.

Feed (lbs.): Pasture, 169 (days); clover hay, 3,457; green oats, 451; wheat bran, 657; mixed grains, 987; corn stover, 2,028. Gerstner, John, Route 2, New Franken

R. O. P. 509—Pettie: Gr. Guernsey; 5 yrs.; fresh Dec. 25, 1918 and Nov. 5, 1919; record from March 8, 1919 to March 8, 1920.

Production: Milk, 7,303 lbs.; fat, 397.1 lbs.; test, 5.44 per cent.

Feed (lbs.): Pasture, 182 (days); corn silage, 5,694; mixed hay, 2,098; ground oats, 150; ground barley, 99; wheat bran, 242; oat straw, 281; arcade feed, 88; mixed feed, 434.

Hettman, Louis, Route 2, New Franken

R. O. P. 510—No. 1 Brownie: Gr. Jersey; 5 yrs.; fresh Jan. 16, 1918 and Dec. 2, 1919; record from March 28, 1919 to March 28, 1920.

Production: Milk, 8,676 lbs.; fat, 429.7 lbs.; test, 4.95 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 8,815; clover hay, 2,472; oat straw, 104; green barley, 335; green oats, 335; wheat bran, 1,032; oil meal, 135.

R. O. P. 511—No. 5 Pearl: Gr. Holstein; 9 yrs.; fresh Sept. 31, 1918 and Oct. 8, 1919; record from March 28, 1919 to March 28, 1920.

Production: Milk, 8,960 lbs.; fat, 386.1 lbs.; test, 4.31 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 7,846; mixed hay, 2,237; oat hay, 104; green barley, 373; green oats, 373; wheat bran, 1,217; oil meal, 126; corn, 190.

Lebergen, Peter, Route 1, New Franken

R. O. P. 512—No. 11 Molly: Gr. Jersey; 5 yrs.; fresh Dec. 20, 1918 and Nov. 19, 1919; record from March 25, 1919 to March 25, 1920.

Production: Milk, 7,476 lbs.; fat, 382.1 lbs.; test, 5.12 per cent.

Feed (lbs.): Pasture 153 (days); silage, 7,015; mixed hay, 2,585; green oats, 375; green barley, 195; wheat bran, 668; flaxseed, 105.

Michiels, Frank, Route 3, Luxemburg

R. O. P. 513—No. 7 Flossie: Gr. Holstein; 6 yrs.; fresh March 31, 1918 and March 20, 1919; record from March 5, 1919, to March 5, 1920.

Production: Milk, 8,806 lbs.; fat, 376.1 lbs.; test, 4.28 per cent.

Feed (lbs.): Pasture, 176 (days); silage, 4,398; clover hay, 3,914; green oats, 248; arcade feed, 135; wheat bran, 45; green barley, 264; mixed feeds, 634.

Peters Brothers, New Franken

R. O. P. 514—No. 10 Flossy: Gr. Guernsey; 4 yrs.; fresh Sept. 5, 1918 and Sept. 12, 1919; record from March 22, 1919 to March 22, 1920.

Production: Milk, 6,936 lbs.; fat, 371.7 lbs.; test, 5.36 per cent.

Feed (lbs.): Pasture, 159 (days); silage, 6,468; clover hay, 6,468; green oats, 248; green barley, 148; wheat bran, 170; flaxseed, 68; mixed feeds, 898.

R. O. P. 515—No. 5 Pearl: Gr. Guernsey; 6 yrs.; fresh Oct. 10, 1918 and Oct. 29, 1919; record from March 22, 1919 to March 22, 1920.

Production: Milk, 8,738 lbs.; fat, 369.7 lbs.; test, 4.24 per cent.

Feed (lbs.): Pasture, 159 (days); silage, 6,468; clover hay, 3,362; green oats, 137; green barley, 141; wheat bran, 163; flaxseed, 73; mixed feeds, 989.

Schauer Brothers, New Franken

R. O. P. 516—No. 2 Beauty: Gr. Br. Swiss; 6 yrs.; fresh, Dec. 8, 1918 and Nov. 7, 1919; record from March 22, 1919 to March 22, 1920.

Production: Milk, 8,533 lbs.; fat, 389.6 lbs.; test, 4.57 per cent.

Feed (lbs.): Pasture, 161 (days); silage, 7,017; mixed hay, 2,486; green oats, 388; green barley, 304; wheat bran, 608; oil meal, 136.

R. O. P. 517—No. 17 Daisy: Gr. Br. Swiss; 5 yrs.; fresh Oct. 7, 1918 and Oct. 11, 1919; record from March 22, 1919 to March 22, 1920.

Production: Milk, 8,435 lbs.; fat, 373.1 lbs.; test, 4.42 per cent.

Feed (lbs.): Pasture, 161 (days); silage, 7,017; mixed hay, 2,486; green oats, 616; green barley, 332; wheat bran, 663; oil meal, 136.

R. O. P. 518—No. 10 Nellie: Gr. Br. Swiss; 13 yrs.; fresh Oct. 23, 1918 and Nov. 20, 1919; record from March 22, 1919 to March 22, 1920.

Production: Milk, 9,042 lbs.; fat, 365.9 lbs.; test, 4.05 per cent.

Feed (lbs.): Pasture, 161 (days); silage, 7,017; mixed hay, 2,486; green oats, 526; green barley, 242; wheat bran, 699; oil meal, 121.

R. O. P. 519—No. 14 Sarah: Gr. Br. Swiss; 6 yrs.; fresh Nov. 2, 1918 and Oct. 10, 1919; record from March 22, 1919 to March 22, 1920.

Production: Milk, 7,829 lbs.; fat, 375.2 lbs.; test, 4.80 per cent.

Feed (lbs.): Pasture, 161 (days); silage, 6,330; mixed hay, 2,315; green oats, 498; green barley, 334; wheat bran, 668; oil meal, 136.

Schneider, Joseph, Route 1, New Franken

R. O. P. 520—No. 3 Dolly: Gr. Holstein; 3 yrs.; fresh Jan. 31, 1919 and Dec. 22, 1919; record from March 25, 1919 to March 25, 1920.

Production: Milk, 10,091 lbs.; fat, 399.7 lbs.; test, 3.96 per cent.

Feed (lbs.): Pasture, 192 (days); silage, 4,728; mixed hay, 3,305; green oats, 622; arcade feed, 256; green barley, 418; wheat bran, 203; oat hay, 900; mixed feed, 864.

R. O. P. 521—No. 1 Flora: Native; 7 yrs.; fresh March 13, 1919 and Feb. 20, 1920; record from March 25, 1919 to March 25, 1920.

Production: Milk, 9,635 lbs.; fat, 377.2 lbs.; test, 3.91 per cent.

Feed (lbs.): Pasture, 192 (days); silage, 4,728; mixed hay, 3,305; arcade feed, 256; green barley, 130; green oats, 588; wheat bran, 476; oat hay, 900; mixed feed, 428.

Speerschneider, Jules Jr., Route 2, New Franken

R. O. P. 522—No. 2 Jacobs: Gr. Holstein; 6 yrs.; fresh April 15, 1918 and April 21, 1919; record from March 29, 1919 to March 29, 1920.

Production: Milk, 10,089 lbs.; fat, 392.4 lbs.; test, 3.89 per cent.

Feed (lbs.): Pasture, 155 (days); mixed feeds, 702; alfalfa, 1,704; clover hay, 2,000; mixed hay, 1,235; green oats, 788; green barley, 557; wheat bran, 453; green alfalfa, 400; corn fodder, 360.

NEW HOLSTEIN KIEL ASSOCIATION.

Kuhn, John, Route 3, Elkhart Lake

R. O. P. 583—B. V. W. 2d: Gr. Holstein; 7 yrs.; fresh Jan. 21 1918 and April 23, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 10,396 lbs.; fat, 385.7 lbs.; test, 3.7 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,792; hay, 1,042; mixed grain, 557.

R. O. P. 584—Blessie 4th: Gr. Holstein; 10 yrs.; fresh Dec. 13, 1918 and Nov. 21, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 10,105 lbs.; fat, 378.0 lbs.; test 3.7 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,832; hay, 1,042; grain, 1,773.

R. O. P. 585—Jack: Gr. Holstein; 6 yrs.; fresh March 7, 1919 and Feb. 12, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 10,933 lbs.; fat, 411.8 lbs.; test, 3.8 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,792; hay, 1,042; grain, 1,322.

Mattes, Geo. F., Route 1, Kiel

R. O. P. 586—Blossom: Gr. Guernsey; 4 yrs.; fresh Dec. 11, 1918 and Dec. 9, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk 7,825 lbs.; fat, 374.4 lbs.; test, 4.7 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,815; hay, 1,542; mixed grain, 1,385.

R. O. P. 587—Rose: Gr. Guernsey; 6 yrs.; fresh Dec. 14, 1918 and Jan. 28, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 9,501 lbs.; fat, 394.2 lbs.; test, 4.15 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,815; hay, 1,622; mixed grain, 920.

Meiselwitz, A. F., Route 3, Elkhart Lake

R. O. P. 588—Bessie: Gr. Guernsey; 4 yrs.; fresh Jan. 9, 1919, and Jan. 11, 1920; record from April 1, 1919, to April 1, 1920.

Production: Milk, 7,591 lbs.; fat, 429.2 lbs.; test, 5.65 per cent.

Feed (lbs.): Pasture, 165 (days); silage, 6,440; hay, 1,055; mixed grain, 1,244.

R. O. P. 589—Jane: Gr. Guernsey; 4 yrs.; fresh Jan. 1, 1919, and Nov. 28, 1919; record from April 1, 1919, to April 1, 1920.

Production: Milk, 8,500 lbs.; fat, 398.4 lbs.; test, 4.7 per cent.

Feed (lbs.): Pasture, 165 (days); silage, 6,440; hay, 1,055; mixed grain, 1,337.

R. O. P. 590—Lily: Gr. Guernsey; 4 yrs.; fresh Dec. 18, 1918 and Dec. 18, 1919; record from April 1, 1919, to April 1, 1920.

Production: Milk, 8,237 lbs.; fat, 388.6 lbs.; test, 4.72 per cent.

Feed (lbs.): Pasture, 165 (days); silage, 6,440; hay, 1,055; mixed grain, 1,306.

Raquet, Chas., Kiel

R. O. P. 591—Brindle: Gr. Holstein; 7 yrs.; fresh Nov. 13, 1918, and Oct. 25, 1919; record from April 1, 1919, to April 1, 1920.

Production: Milk, 11,100 lbs.; fat, 409.1 lbs.; test, 3.7 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,825; hay, 900; mixed grain, 1,612.

R. O. P. 592—Johanna: Gr. Holstein; 4 yrs.; fresh Jan. 27, 1919, and Dec. 11, 1919; record from April 1, 1919, to April 1, 1920.

Production: Milk, 9,745 lbs.; fat, 397.3 lbs.; test, 4.1 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,825; hay, 900; mixed grain, 1,252.

R. O. P. 593—Shaggy: Gr. Holstein; 6 yrs.; fresh Jan. 27, 1919, and Jan. 7, 1920; record from April 1, 1919, to April 1, 1920.

Production: Milk, 8,925 lbs.; fat, 366.7 lbs.; test, 4.1 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,825; hay, 900; mixed grain, 1,256.

Thielke, F. F. & Son, Route 2, Kiel

R. O. P. 594—Alicia of Louis Corners, 64,828: Reg. Guernsey; 3 yrs.; fresh Feb. 3, 1919, and Jan. 2, 1920; record from April 1, 1919, to April 1, 1920.

Production: Milk, 10,833 lbs.; fat, 617.4 lbs.; test, 5.6 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 8,237; hay, 1,830; mixed grain, 2,374.

R. O. P. 595—Beauty of Louis Corners, 45,323: Reg. Guernsey; 6 yrs.; fresh Jan. 13, 1919, and Jan. 21, 1920; record from April 1, 1919, to April 1, 1920.

Production: Milk, 8,687 lbs.; fat, 423.7 lbs.; test, 4.9 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 8,237; hay, 1,900; mixed grain, 1,050.

R. O. P. 596—Dairy Maid of Louis Corners, 45,320: Reg. Guernsey; 6 yrs.; fresh Oct. 9, 1918, and Oct. 10, 1919; record from April 1, 1919, to April 1, 1920.

Production: Milk, 8,018 lbs.; fat, 396.9 lbs.; test, 4.94 per cent.

Feed (lbs.): Pasture, 132 (days); silage, 8,837; hay, 2,340; mixed grain, 2,082.

R. O. P. 597—Elsie of Louis Corners, 64,827: Reg. Guernsey; 3 yrs.; fresh Nov. 15, 1918, and Nov. 1, 1919; record from April 1, 1919, to April 1, 1920.

Production: Milk, 7,711 lbs.; fat, 396.5 lbs.; test, 5.1 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 8,237; hay, 1,900; mixed grain, 1,872.

R. O. P. 598—Lottie: Gr. Guernsey; 5 yrs.; fresh March 9, 1919, and Feb. 14, 1920; record from April 1, 1919, to April 1, 1920.

Production: Milk, 7,612 lbs.; fat, 388.3 lbs.; test, 5.1 per cent.

Feed (lbs.): Pasture, 193 (days); silage, 8,137; hay, 1,900; mixed grain, 1,635.

R. O. P. 599—Meta: Gr. Guernsey; 11 yrs.; fresh April 5, 1918, and March 11, 1919; record from April 1, 1919, to April 1, 1920.

Production: Milk, 10,937 lbs.; fat, 461.6 lbs.; test, 4.22 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 8,237; hay, 1,900; mixed grain, 1,764.

R. O. P. 600—Primrose's Maid of Louis Corners, 67,052: Reg. Guernsey; 3 yrs.; fresh Feb. 10, 1919, and Jan. 1, 1920; record from April 1, 1919, to April 1, 1920.

Production: Milk, 9,411 lbs.; fat, 411.9 lbs.; test, 4.45 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 8,237; hay, 1,830; mixed grain, 1,650.

R. O. P. 601—Violet of Louis Corners, 73,466: Reg. Guernsey, 2 yrs.; fresh Dec. 29, 1918, and Dec. 13, 1919; record from April 1, 1919, to April 1, 1920.

Production: Milk, 7,768 lbs.; fat, 414.0 lbs.; test, 5.33 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 8,237; hay, 1,900; mixed grain, 1,586.

Voight, Armie, Kiel

R. O. P. 602—Beauty: Gr. Guernsey; 4 yrs.; fresh Dec. 2, 1918, and Oct. 29, 1919; record from April 1, 1919, to April 1, 1920.

Production: Milk, 7,850 lbs.; fat, 435.6 lbs.; test, 5.55 per cent.

Feed (lbs.): Pasture, 161 (days); silage, 7,795; hay, 1,318; mixed grain, 2,032.

R. O. P. 603—Belle of Cleveland 69,470: Reg. Guernsey; 3 yrs.; fresh June 10, 1918, and April 17, 1919; record from April 1, 1919, to April 1, 1920.

Production: Milk, 8,102 lbs.; fat, 424.0 lbs.; test, 5.23 per cent.

Feed (lbs.): Pasture, 162 (days); silage, 6,895; hay, 1,048; mixed grain, 1,693.

R. O. P. 604—Bessie of Cleveland, 45,246: Reg. Guernsey; 6 yrs.; fresh Dec. 12, 1918, and Oct. 24, 1919; record from April 1, 1919, to April 1, 1920.

Production: Milk, 9,359 lbs.; fat, 432.0 lbs.; test, 4.64 per cent.

Feed (lbs.): Pasture, 161 (days); silage, 7,795; hay, 1,318; mixed grain, 2,032.

R. O. P. 605—Dollie of Louis Corners 30,758: Reg. Guernsey; 9 yrs.; fresh March 15, 1918, and April 1, 1919; record from April 1, 1919, to April 1, 1920.

Production: Milk, 7,165 lbs.; fat, 394.8 lbs.; test, 5.5 per cent.

Feed (lbs.): Pasture, 161 (days); silage, 7,795; hay, 1,048; mixed grain, 1,434.

R. O. P. 606—Polly: Gr. Guernsey; 4 yrs.; fresh Oct. 6, 1918, and Sept. 10, 1919; record from April 1, 1919, to April 1, 1920.

Production: Milk, 6,594 lbs.; fat, 374.5 lbs.; test, 5.7 per cent.

Feed (lbs.): Pasture, 162 (days); silage, 8,695; hay, 1,318; mixed grain 2,053.

R. O. P. 607—Queen: Gr. Guernsey; 6 yrs.; fresh Nov. 24, 1918 and Oct. 22, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 8,612 lbs.; fat, 446.6 lbs.; test, 5.2 per cent.

Feed (lbs.): Pasture, 162 (days); silage, 8,695; hay, 1,318; mixed grain, 2,109.

R. O. P. 608—Spottie: Gr. Guernsey; 3 yrs.; fresh Jan. 11, 1919 and Dec. 10, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 7,546 lbs.; fat, 394.5 lbs.; test, 5.2 per cent.

Feed (lbs.): Pasture, 162 (days); silage, 8,705; hay, 988; mixed grain, 1,689.

R. O. P. 609—Topsy of Schleswig 76,163: Reg. Guernsey; 2 yrs.; fresh Dec. 25, 1918, and Nov. 13, 1919; record from April 1, 1919, to April 1, 1920.

Production: Milk, 8,024 lbs.; fat, 389.2 lbs.; test, 4.85 per cent.

Feed (lbs.): Pasture, 161 (days); silage, 7,795; hay, 1,308; mixed grain, 2,112.

Voight, Theo., Kiel

R. O. P. 610—Dairy Maid: Gr. Guernsey; 5 yrs.; fresh Jan. 25, 1919, and Jan. 18, 1920; record from April 1, 1919, to April 1, 1920.

Production: Milk, 9,362 lbs.; fat, 422.3 lbs.; 4.5 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 7,220; hay, 2,405; mixed grain, 2,141.

R. O. P. 611—Daisy: Gr. Guernsey; 5 yrs.; fresh Nov. 19, 1918 and Feb. 27, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 7,657 lbs.; fat, 412.2 lbs.; test, 5.4 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 4,350; hay, 2,205; mixed grain, 2,103.

R. O. P. 612—Lily: Gr. Guernsey; 5 yrs.; fresh Jan. 29, 1919 and Jan. 28, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 6,501 lbs.; fat, 367.6 lbs.; test, 5.64 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 6,785; hay, 2,205; mixed grain, 2,103.

R. O. P. 613—Lulu: Gr. Guernsey; 5 yrs.; fresh Jan. 26, 1919 and Feb. 21, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 8,312 lbs.; fat, 392.4 lbs.; test, 4.7 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 6,350; hay, 2,205; mixed grain 1,995.

R. O. P. 614—Nancy: Gr. Guernsey; 3 yrs.; fresh Nov. 22, 1918; record from April 1, 1919 to April 1, 1920.

Production: Milk, 8,373 lbs.; fat, 395.7 lbs.; test, 4.68 per cent.

Feed (lbs.): Pasture, 163 (days); silage, 5,915; hay, 2,205; mixed grain, 1,994.

NORTH CRANDON ASSOCIATION

Dixon, Jay A., North Crandon

R. O. P. 1098—Mary of Levelacres: Gr. Guernsey; 4 yrs.; fresh April 15, 1920 and April 16, 1921; record from May 1, 1920 to May 1, 1921.

Production: Milk, 8,828 lbs.; fat, 541.8 lbs.; test, 5 per cent.

Feed (lbs.): Pasture, 164 (days); hay, 1,140; grain, 1,106; rutabagas, 6,916.

R. O. P. 1099—Nelly of Levelacres: Gr. Guernsey; 4 yrs.; fresh May —, 1919 and June 20, 1920; record from May 1, 1920 to May 1, 1921.
Production: Milk, 7,372 lbs.; fat, 392.4 lbs.; test, 5.32 per cent.
Feed (lbs.): Pasture, 164 (days); hay, 1,100; grain, 894; rutabagas, 6,916.

Peterson, Henry, North Crandon

R. O. P. 1100—Bessie: Gr. Holstein; 7 yrs.; fresh May 14, 1920 and April 13, 1921; record from May 1, 1920 to May 1, 1921.
Production: Milk, 11,078 lbs.; fat, 476.3 lbs.; test, 3.67 per cent.
Feed (lbs.): Pasture, 184 (days); hay, 1,800; grain, 802; oil meal, 60; bagas, 5,400.

R. O. P. 1101—Judy: Gr. Holstein; 5 yrs.; fresh April 14, 1920 and due June 12, 1921; record from May 1, 1920 to May 1, 1921.
Production: Milk, 10,946 lbs.; fat, 367.4 lbs.; test, 3.33 per cent.
Feed (lbs.): Pasture, 184 (days); hay, 1,800; grain, 1,564; bagas, 4,650.

Rasmussen, C. J., North Crandon

R. O. P. 1102—Heliotrope of Amandale, 40,940: Reg. Guernsey; 8 yrs.; fresh Jan. 14, 1920 and Dec. 17, 1920; record from May 1, 1920 to May 1, 1921.
Production: Milk, 9,434 lbs.; fat, 445.2 lbs.; test, 4.72 per cent.
Feed (lbs.): Pasture, 184 (days); silage, 4,500; hay, 1,642; grain, 2,757.

OOSTBURG ASSOCIATION

Bloemers, James, Oostburg

R. O. P. 735—Belle: Gr. Holstein; 8 yrs.; fresh Feb. 4, 1919 and Dec. 25, 1919; record from July 1, 1919 to July 1, 1920.
Production: Milk, 10,878 lbs.; fat, 384.1 lbs.; test, 3.53 per cent.
Feed (lbs.): Pasture, 122 (days); silage, 6,815; hay, 1,541; fodder, 480; grain mixture, 917; oats, 623; bran, 657; gluten, 487; oil meal, 525; Schumacher, 134; germ meal, 27.

R. O. P. 736—Susan: Gr. Holstein; 5 yrs.; fresh Jan. 10, 1919 and Dec. 26, 1919; record from July 1, 1919 to July 1, 1921.
Production: Milk, 11,476 lbs.; fat, 404.1 lbs.; test, 3.52 per cent.
Feed (lbs.): Pasture, 122 (days); silage, 6,815; hay, 1,541; fodder, 480; grain mixture, 762; oats, 623; bran, 657; gluten, 487; oil meal, 525; Schumacher, 134; germ meal, 27.

Brill, J. P. Jr., Sheboygan

R. O. P. 737—Star of Wilson, 214,175: Reg. Holstein; 7 yrs.; fresh Jan. 30, 1919 and Jan. 9, 1920; record from July 1, 1919 to July 1, 1920.
Production: Milk, 16,714 lbs.; fat, 591.9 lbs.; test, 3.54 per cent.
Feed (lbs.): Pasture, 122 (days); silage, 9,630; hay, 1,158; oil meal, 409; grain mixture, 725; bran, 1,003; oats, 606; corn, 527; gluten, 709; Schumacher, 292.

Brusse, Garret, Oostburg

R. O. P. 738—Susie: Gr. Holstein; 6 yrs.; fresh Dec. 19, 1919; record from July 1, 1919 to July 1, 1920.
Production: Milk, 11,415 lbs.; fat, 394.8 lbs.; test, 3.46 per cent.
Feed (lbs.): Pasture, 122 (days); silage, 5,955; hay, 698; stalks, 310; grain mixture, 510; oats and corn, 296; bran, 490; gluten, 717; climax, 316; cottonseed meal, 19; Schumacher, 72; ready ration, 223.

Harmeling, E. B. & Sons, Oostburg

R. O. P. 739—Alberta: Gr. Guernsey; 4 yrs.; fresh Oct. 31, 1918 and Dec. 2, 1919; record from July 1, 1919 to July 1, 1920.
Production: Milk, 10,195 lbs.; fat, 473.7 lbs.; test, 4.65 per cent.
Feed (lbs.): Pasture, 122 (days); silage, 3,600; hay (alfalfa and clover), 1,402; grain mixture, 311; stover, 94; bran, 280; gluten, 215; oil meal, 197; cottonseed meal, 120; corn meal, 62; climax, 180; oats, 62; rye, 62.

R. O. P. 740—Bessie: Gr. Guernsey; 6 yrs.; fresh Jan. 23, 1919 and Dec. 18, 1919; record from July 1, 1919 to July 1, 1920.
Production: Milk, 8,259 lbs.; fat, 371 lbs.; test, 4.49 per cent.
Feed (lbs.): Pasture, 122 (days); silage, 3,600; hay, 1,402; cottonseed meal, 120; stover, 465; oil meal, 321; oats, 31; rye, 51; gluten, 275; bran, 268; schumacher, 350; balanced ration, 155; climax, 180; corn meal, 31.

Hilbelink, William, Oostburg

R. O. P. 741—Eleven: Gr. Holstein; 7 yrs.; fresh May 27, 1918 and Nov. 4, 1919; record from July 1, 1919 to July 1, 1920.

Production: Milk, 10,211 lbs.; fat, 382.3 lbs.; test, 3.75 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 13,161; Wisconsin balanced ration, 216; Cream City ration, 124; hay, 605; gluten, 353; bran, 455; corn, 331; oats, 607; grain mixture, 258.

R. O. P. 742—Five: Gr. Holstein; 14 yrs.; fresh April 4, 1919; record from July —, 1919 to July —, 1920.

Production: Milk, 10,075 lbs.; fat, 420.4 lbs.; test, 4.17 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 13,161; oil meal, 208; Wisconsin balanced ration, 176; pea vines, 310; straw, 1,054; bran, 275; gluten, 258; Cream City ration, 72; corn, 203; oats, 433.

R. O. P. 743—Six: Gr. Holstein; 3 yrs.; fresh June 19, 1919 and April 29, 1920; record from July —, 1919 to July —, 1920.

Production: Milk, 12,071 lbs.; fat, 415.3 lbs.; test, 3.44 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 13,161; straw, 310; hay, 605; pea vines, 1,054; oil meal, 93; balanced ration, 272; bran, 247; gluten, 378; corn, 154; oats, 439; grain mixture, 996.

Hyink, Henry, Oostburg

R. O. P. 744—Molly: Gr. Holstein; 9 yrs.; fresh March 22, 1919 and April 14, 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 9,775 lbs.; fat, 368.4 lbs.; test, 3.77 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 6,920; hay, 1,520; bran, 469; dairy feed, 1,273; gluten, 651; straw, 930; oil meal, 240; hominy, 93; oats, 361.

Koeppe, F. J. Oostburg

R. O. P. 745—Augusta: Gr. Holstein; 4 yrs.; fresh May 18, 1920; record from July —, 1919 to July —, 1920.

Production: Milk, 10,035 lbs.; fat, 370.5 lbs.; test, 3.69 per cent.

Feed (lbs.): Pasture, 122 (days). (No data on other feeds.)

R. O. P. 746—Bessie: Gr. Holstein; 3 yrs.; fresh ———; record from July —, 1919 to July —, 1920.

Production: Milk, 10,995 lbs.; fat, 385.2 lbs.; test, 3.5 per cent.

Feed (lbs.): Pasture, 122 (days). (No data on feeds.)

R. O. P. 747—Madge: Gr. Holstein; 6 yrs.; fresh Nov. 1, 1919; record from July —, 1919 to July —, 1920.

Production: Milk, 10,887 lbs.; fat, 394.3 lbs.; test, 3.62 per cent.

Feed (lbs.): Pasture, 122 (days). (No data on other feeds.)

R. O. P. 748—Pearl: Gr. Holstein; 5 yrs.; fresh Dec. 15, 1919; record from July —, 1919 to July —, 1920.

Production: Milk, 11,401 lbs.; fat, 415.9 lbs.; test, 3.65 per cent.

Feed (lbs.): Pasture, 61 (days); hay, 610; silage, 6,260; grain mixture, 553; oats, 372; oil meal, 435; bran, 598; gluten, 738; schumacher, 146; climax, 70; stover, 600.

Laarman, Garret, Oostburg

R. O. P. 749—Eleven: Native; 4 yrs.; fresh March 23, 1919 and Feb. 8, 1920; record from July —, 1919 to July —, 1920.

Production: Milk, 7,437 lbs.; fat, 387 lbs.; test, 5.2 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,184; hay, 2,346; stalks, 1,183; grain mixture, 951; corn, 402; bran, 572; gluten, 442; oats, 432; oil meal, 118; green corn, 475; schumacher, 20.

R. O. P. 750—Nine: Native; 9 yrs.; fresh Feb. 19, 1919 and Jan. 19, 1920; record from July —, 1919 to July —, 1921.

Production: Milk, 11,035 lbs.; fat, 390.4 lbs.; test, 4.54 per cent.

Feed (lbs.): Pasture, 107 (days); silage, 6,649; hay, 2,345; grain mixture, 1,012; corn, 447; schumacher, 20; bran, 629; gluten, 487; oats, 457; oil meal, 121; stalks, 1,183; green corn, 475.

R. O. P. 751—Twelve: Gr. Holstein; 5 yrs.; fresh Feb. 16, 1919 and Dec. 29, 1919; record from July —, 1919 to July —, 1920.

Production: Milk, 11,030 lbs.; fat, 428.5 lbs.; test, 3.88 per cent.

Feed (lbs.): Pasture, 137 (days); silage, 6,990; hay, 2,345; stalks, 833; grain mixture, 951; corn, 511; gluten, 551; bran, 719; oats, 541; oil meal, 121; green corn, 475; schumacher, 20.

Lohuis, Will, Oostburg.

R. O. P. 752—Johanna Elmen Rue 2d: Reg. Holstein; — yrs.; fresh June 19, 1919 and Feb. 2, 1920; record from July —, 1919 to July —, 1920.

Production: Milk, 13,446 lbs.; fat, 536.5 lbs.; test, 3.99 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 10,155; hay, 1,278; stalks, 248; grain mixture, 1,072; beet pulp, 64; schumacher, 476; oats, 452; bran, 452; cottonseed meal, 198; oil meal, 239; gluten, 457; barley, 25; corn meal, 64; hominy, 69.

R. O. P. 753—Lady Johanna Witt De Kol: Reg. Holstein; — yrs.; fresh March 11, 1920; record from July —, 1919 to July —, 1920.

Production: Milk, 13,199 lbs.; fat, 437.1 lbs.; test, 3.31 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 10,085; hay, 1,309; stalks, 248; corn meal, 275; oats, 378; grain mixture, 1,124; bran, 598; oil meal, 203; cottonseed meal, 158; schumacher, 402; gluten, 275; hominy, 99.

R. O. P. 754—Viola: Reg. Holstein; 3 yrs.; fresh May 27, 1919 and June 20, 1920; record from July —, 1919 to July —, 1920.

Production: Milk, 13,518 lbs.; fat, 500.8 lbs.; test, 3.7 per cent.

Feed (lbs.): Pasture, 92 (days); silage, 9,780; hay, 1,278; stover, 248; corn meal, 30; barley, 51; grain mixture, 1,530; bran, 502; oats, 377; gluten, 396; cottonseed meal, 105; oil meal, 192; schumacher, 283; hominy, 35.

Ruesink, Garret, Oostburg

R. O. P. 755—Lilly: Native; 7 yrs.; fresh Dec. 28, 1919; record from July —, 1919 to July —, 1920.

Production: Milk, 11,608 lbs.; fat, 400.3 lbs.; test, 3.45 per cent.

Feed (lbs.): Pasture, 122 (days); hay, 1,830; stalks, 2,736; oats, 506; bran, 362; oil meal, 235; corn, 402; gluten, 460; grain mixture, 854; bean straw, 1,210; schumacher, 83; sucrene, 4.

R. O. P. 756—Lucy: Native; — yrs.; fresh Dec. 6, 1919; record from July —, 1919 to July —, 1920.

Production: Milk, 9,995 lbs.; fat, 374.7 lbs.; test, 3.75 per cent.

Feed (lbs.): Pasture, 122 (days); hay, 1,830; stalks, 2,736; sucrene, 67; schumacher, 77; bean straw, 1,210; oil meal, 281; gluten, 488; bran, 395; oats, 516; corn and cob meal, 432; grain mixture, 854.

R. O. P. 757—Queen: Native; 6 yrs.; fresh Nov. 17, 1919; record from July —, 1919 to July —, 1920.

Production: Milk, 11,518 lbs.; fat, 365.7 lbs.; test, 3.18 per cent.

Feed (lbs.): Pasture, 122 (days); hay, 1,830; stalks, 2,736; sucrene, 67; schumacher, 77; corn, 432; bean straw, 1,210; oil meal, 281; gluten, 488; bran, 395; oats, 536; grain mixture, 854.

R. O. P. 758—Spot: Native; 8 yrs.; fresh Jan. 15, 1920; record from July 1, 1919 to July 1, 1920.

Production: Milk, 10,584 lbs.; fat, 380.4 lbs.; test, 3.59 per cent.

Feed (lbs.): Pasture, 122 (days); hay, 1,830; stalks, 2,736; bean straw, 1,210; sucrene, 67; schumacher, 77; corn and cob meal, 1,210; oil meal, 281; gluten, 488; bran, 395; oats, 536; grain mixture, 854.

R. O. P. 759—Star: Native; 4 yrs.; fresh Oct. 21, 1919; record from July —, 1919 to July —, 1920.

Production: Milk, 10,821 lbs.; fat, 384.7 lbs.; test, 3.56 per cent.

Feed (lbs.): Pasture, 122 (days); hay, 1,830; stalks, 2,736; bean straw, 1,210; sucrene, 67; schumacher, 77; corn and cob meal, 1,210; oil meal, 281; gluten, 488; bran, 395; oats, 536; grain mixture, 854.

R. O. P. 760—Topsy: Native; 6 yrs.; fresh Dec. 10, 1919; record from July —, 1919 to July —, 1920.

Production: Milk, 11,967 lbs.; fat, 414.1 lbs.; test, 3.46 per cent.

Feed (lbs.): Pasture, 122 (days); hay, 1,730; stalks, 2,556; sucrene, 52; schumacher, 83; oil meal, 288; grain mixture, 854; bean straw, 1,210; bran, 415; oats, 565; corn, 454; gluten, 513.

POLK COUNTY ASSOCIATION

Marshall, W. S., Centuria

R. O. P. 734—Marie: Gr. Holstein; 6 yrs.; fresh Aug. 25, 1918 and Jan. 26, 1920; record from Aug. 1, 1919 to Aug. 1, 1920.

Production: Milk, 9,490 lbs.; fat, 456.1 lbs.; test, 4.81 per cent.

Feed (lbs.): Pasture, 169 (days); hay, 3,940; fodder, 2,004; oats, 426; barley, 426; corn, 319; bran, 82; oil meal, 165.

McLean, D. R., Route 4, Amery

R. O. P. 574—Nemo: Native; 7 yrs.; fresh Jan. 11, 1919 and Jan. 15, 1920; record from July 31, 1919 to July 31, 1920.

Production: Milk, 7,995 lbs.; fat, 367.3 lbs.; test 4.59 per cent.

Feed (lbs.): Pasture, 169 (days); silage, 7,836; hay, 2,212; oats, 405; barley, 297; fodder, 608; bran, 244.

RACINE KENOSHA ASSOCIATION

Holloway Brothers, Union Grove

R. O. P. 1105—No. 2: Gr. Jersey; — yrs.; fresh ———; record from June 1, 1920 to June 1, 1921.

Production: Milk, 7,470 lbs.; fat, 428.1 lbs.; test, 5.73 per cent.

Feed (lbs.): Pasture, 115 (days); silage, 8,892; hay, 2,606; grain mixture, 2,992.

R. O. P. 1106—No. 7: Gr. Jersey; — yrs.; fresh April 19, 1920; record from June 1, 1920 to June 1, 1921.

Production: Milk, 8,855 lbs.; fat, 375.9 lbs.; test, 4.25 per cent.

Feed (lbs.): Pasture, 115 (days); silage, 8,842; hay, 2,606; grain mixture, 3,024.

R. O. P. 1107—No. 13: Gr. Jersey; 6 yrs.; fresh ———; record from June 1, 1920 to June 1, 1921.

Production: Milk, 8,810 lbs.; fat, 470.6 lbs.; test, 5.34 per cent.

Feed (lbs.): Pasture, 115 (days); silage, 8,842; hay, 2,606; grain mixture, 2,813.

R. O. P. 1108—No. 621: Gr. Jersey; 8 yrs.; fresh ———; record from June 1, 1920 to June 1, 1921.

Production: Milk, 11,213 lbs.; fat, 516.3 lbs.; test, 4.60 per cent.

Feed (lbs.): Pasture, 115 (days); silage, 8,842; hay, 2,606; grain mixture, 3,591.

R. O. P. 1109—No. 629: Gr. Jersey; — yrs.; fresh Dec. —, 1919 and April 7, 1921; record from June 1, 1920 to June 1, 1921.

Production: Milk, 7,267 lbs.; fat, 389.8 lbs.; test, 5.36 per cent.

Feed (lbs.): Pasture, 115 (days); silage, 4,913; hay, 2,606; grain mixture, 3,282.

R. O. P. 1110—No. 630: Gr. Jersey; — yrs.; fresh ———; record from June 1, 1920 to June 1, 1921.

Production: Milk, 8,044 lbs.; fat, 421 lbs.; test, 5.23 per cent.

Feed (lbs.): Pasture, 115 (days); silage, 7,912; hay, 2,296; grain mixture, 2,675.

R. O. P. 1111—No. 798: Gr. Jersey; — yrs.; fresh March —, 1920 and April 2, 1921; record from June 1, 1920 to June 1, 1921.

Production: Milk, 8,565 lbs.; fat, 376.6 lbs.; test, 4.4 per cent.

Feed (lbs.): Pasture, 115 (days); silage, 8,842; hay, 2,606; grain mixture, 2,765.

R. O. P. 1112—No. 806: Gr. Jersey; — yrs.; fresh Aug. —, 1919 and Oct. 26, 1920; record from June 1, 1920 to June 1, 1921.

Production: Milk, 9,311 lbs.; fat, 407.8 lbs.; test, 4.38 per cent.

Feed (lbs.): Pasture, 115 (days); silage, 8,842; hay, 2,606; grain mixture, 3,076.

R. O. P. 1113—Star: Gr. Jersey; 12 yrs.; fresh July —, 1920; record from June 1, 1920 to June 1, 1921.

Production: Milk, 9,038 lbs.; fat, 398.7 lbs.; test, 4.41 per cent.

Feed (lbs.): Pasture, 115 (days); silage, 8,892; hay, 2,606; grain mixture, 3,227.

Hansen, Fred, Union Grove

R. O. P. 1114—Carrie: Gr. Holstein; 6 yrs.; fresh Nov. 18, 1920 and ———; record from June 1, 1920 to June 1, 1921.

Production: Milk, 9,561 lbs.; fat, 406.7 lbs.; test, 4.25 per cent.

Feed (lbs.): Pasture, 141 (days); silage, 10,698; hay, 2,176; corn, stover, 774; grain mixture, 2,819.

Nelson, Harvey A., Union Grove

R. O. P. 1115—Edith: Gr. Holstein; 3 yrs.; fresh Aug. 10, 1919 and July 1, 1920; record from June 1, 1920 to June 1, 1921.

Production: Milk, 11,066 lbs.; fat, 444.6 lbs.; test, 4.02 per cent.

Feed (lbs.): Pasture, 61 (days); silage, 15,323; hay, 2,330; oats and peas, 240; unicorn, 3,581.

R. O. P. 1116—Primrose: Gr. Holstein; 7 yrs.; fresh June 12, 1920 and June 1, 1919; record from June 1, 1920 to June 1, 1921.

Production: Milk, 12,734 lbs.; fat, 397.4 lbs.; test, 3.12 per cent.

Feed (lbs.): Pasture, 61 (days); silage, 17,258; hay, 2,230; oats and peas, 240; unicorn, 3,804.

R. O. P. 1117—Princess Segis Change Colantha, 399,676: Reg. Holstein; 3 yrs.; fresh May 12, 1920 and May 14, 1919; record from June 1, 1920 to June 1, 1921.

Production: Milk, 10,819 lbs.; fat, 371.6 lbs.; test, 3.43 per cent.

Feed (lbs.): Pasture, 61 (days); silage, 17,067; hay, 2,230; oats and peas, 240; unicorn, 3,958.

R. O. P. 1118—Sophia: Gr. Holstein; 4 yrs.; fresh July 11, 1919 and July 29, 1920; record from June 1, 1920 to June 1, 1921.

Production: Milk, 12,428 lbs.; fat, 462.1 lbs.; test, 3.72 per cent.

Feed (lbs.): Pasture, 61 (days); silage, 17,123; hay, 2,228; oats and peas, 240; unicorn, 3,866.

R. O. P. 1119—Tettje Korndyke of Riverview, 443,689: Reg. Holstein; 3 yrs.; fresh Sept. 10, 1920 and Nov. 26, 1919; record from June 1, 1920 to June 1, 1921.

Production: Milk, 11,634 lbs.; fat, 426.3 lbs.; test, 3.66 per cent.

Feed (lbs.): Pasture, 61 (days); silage, 17,291; hay, 2,230; oats and peas, 240; unicorn, 4,383.

Powles, F. S., Union Grove

R. O. P. 1120—Cox: Gr. Holstein; 6 yrs.; fresh Oct. 17, 1920; record from June —, 1920 to June —, 1921.

Production: Milk, 10,710 lbs.; fat, 401.5 lbs.; test, 3.75 per cent.

Feed (lbs.): Pasture, 209 (days); silage, 9,376; hay, 1,956; corn stover, 40; grain mixture, 2,825.

R. O. P. 1121—Cunningham Cow: Gr. Holstein; 5 yrs.; fresh ———; record from June —, 1920 to June —, 1921.

Production: Milk, 9,080 lbs.; fat, 378.9 lbs.; test, 4.17 per cent.

Feed (lbs.): Pasture, 209 (days); silage, 9,376; hay, 1,951; grain mixture, 1,959; corn stover, 40.

R. O. P. 1122—Reed Cow: Gr. Holstein; 7 yrs.; fresh Sept. 20, 1919 and Oct. 27, 1921; record from June —, 1920 to June —, 1921.

Production: Milk, 9,780 lbs.; fat, 409.9 lbs.; test, 4.19 per cent.

Feed (lbs.): Pasture, 209 (days); silage, 9,416; hay, 1,804; corn fodder, 40; grain mixture, 2,664.

Sheen, H. W., Bristol

R. O. P. 1104—Rachel Spofford Burke, 223,072: Reg. Holstein; 7 yrs.; fresh April 18, 1920; record from June —, 1920 to June —, 1921.

Production: Milk, 12,566 lbs.; fat, 427.9 lbs.; test, 3.41 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 10,403; hay, 1,388; oats and peas, 340; grain mixture, 3,555.

Skewes, Clinton, Union Grove

R. O. P. 1123—Pink: Gr. Holstein; — yrs.; fresh Sept. 1, 1920; record from June —, 1920 to June —, 1921.

Production: Milk, 12,479 lbs.; fat, 433.7 lbs.; test, 3.48 per cent.

Feed (lbs.): Pasture, 129 (days); silage, 15,415; hay, 2,208; mixed grain, 3,369.

R. O. P. 1124—Polly: Gr. Holstein; 6 yrs.; fresh Oct. 3, 1920; record from June 1, 1920 to June 1, 1921.

Production: Milk, 11,506 lbs.; fat, 410.8 lbs.; test, 3.57 per cent.

Feed (lbs.): Pasture, 98 (days); silage, 14,895; hay, 2,208; grain mixture, 3,092.

R. O. P. 1125—Star: Gr. Holstein; — yrs.; fresh Sept. 20, 1920; record from June 1, 1920 to June 1, 1921.

Production: Milk, 11,266 lbs.; fat, 426.1 lbs.; test, 3.78 per cent.

Feed (lbs.): Pasture, 129 (days); silage, 15,415; hay, 2,208; mixed grain, 3,236.

Skewes, Edward H., Union Grove

R. O. P. 1126—Lame Back: Gr. Holstein; — yrs.; fresh ———; record from June 1, 1920 to June 1, 1921.

Production: Milk, 12,151 lbs.; fat, 399.4 lbs.; test, 3.29 per cent.

Feed (lbs.): Pasture, 92 (days); silage, 10,348; hay, 3,332; grain mix-

ture, 2,940.

R. O. P. 1127—Pet: Gr. Holstein; — yrs.; fresh ———; record from June 1, 1920 to June 1, 1921.

Production: Milk, 12,194 lbs.; fat, 396.9 lbs.; test, 3.25 per cent.

Feed (lbs.): Pasture, 92 (days); silage, 10,448; hay, 3,334; grain mixture, 3,213.

R. O. P. 1128—Queen: Gr. Holstein; 7 yrs.; fresh Nov. 1, 1920; record from June 1, 1920 to June 1, 1921.

Production: Milk, 12,001 lbs.; fat, 399.3 lbs.; test, 3.33 per cent.

Feed (lbs.): Pasture, 62 (days); silage, 10,248; hay, 2,971; grain mixture, 3,311.

R. O. P. 1129—White Legs: Gr. Holstein; 9 yrs.; fresh April 1, 1920; record from June 1, 1920 to June 1, 1921.

Production: Milk, 14,057 lbs.; fat, 500.3 lbs.; test, 3.56 per cent.

Feed (lbs.): Pasture, 92 (days); silage, 10,248; hay, 3,332; mixed grains, 3,403.

RICHFIELD ASSOCIATION

Held, Henry, Schliesingerville

R. O. P. 830—Alma: Gr. Holstein; 6 yrs.; fresh Feb. 10, 1920 and Feb. 16, 1921; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 11,170 lbs.; fat, 397.3 lbs.; test, 3.56 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,540; hay, 1,350; ration, 2,520; dairy feed, 90.

Kroehler, John, Richfield

R. O. P. 831—Bessy: Gr. Holstein; 8 yrs.; fresh Oct. 25, 1919 and Nov. 17, 1920; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 12,035 lbs.; fat, 405.5 lbs.; test, 3.37 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,540; hay, 1,080; alfalfa, 180; grain ration, 3,240; oil meal, 60.

R. O. P. 832—Blue Bell Hengerveld De Kol, 204,822: Reg. Holstein; 7 yrs.; fresh Feb. 8, 1920; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 11,721 lbs.; fat, 413.1 lbs.; test, 3.52 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 5,400; hay, 1,500; grain ration, 3,740; oil meal, 630.

R. O. P. 833—Petunia Blue Bell, 320,991: Reg. Holstein; 4 yrs.; fresh Jan. 15, 1920 and Dec. 16, 1920; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 11,771 lbs.; fat, 413.1 lbs.; test, 3.51 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 4,740; hay, 1,260; grain ration, 1,980; oil meal, 60.

R. O. P. 834—Raschen: Gr. Holstein; — yrs.; fresh Dec. 23, 1919 and Jan. 2, 1921; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 11,030 lbs.; fat, 391 lbs.; test, 3.54 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 5,340; clover and alfalfa hay, 1,380; grain ration, 2,070; oil meal, 90.

R. O. P. 835—Snowflake Junita Wartena, 320,990: Reg. Holstein; 4 yrs.; fresh Dec. 23, 1919; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 8,813 lbs.; fat, 390.9 lbs.; test, 4.4 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 5,730; hay, 6,990; ration, 2,370; oil meal, 120.

Melius Brothers, Richfield

R. O. P. 836—Josephine Soldene Pietertje 2d, 270,564: Reg. Holstein; 5 yrs.; fresh Nov. 25, 1919 and Dec. 19, 1920; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 11,196 lbs.; fat, 456.8 lbs.; test, 4.08 per cent.

Feed (lbs.): Pasture, 152 (days); silage, 5,100; hay, 2,160; grain ration, 2,730; oil meal, 60.

Schowalter, Henry, Jackson

R. O. P. 837—Lottie Aaltje De Kol Pietertje, 253,569: Reg. Holstein; 6 yrs.; fresh March 21, 1920; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 13,204 lbs.; fat, 374.8 lbs.; test, 2.84 per cent.

Feed (lbs.): Pasture, 214 (days); silage, 4,950; hay, 4,590; ration, 1,320.

Wiedmeyer, Ambrose A., Richfield

R. O. P. 838—Georgiana: Gr. Holstein; 6 yrs.; fresh Jan. 26, 1920; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 10,957 lbs.; fat, 369.6 lbs.; test, 3.37 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 5,850; pea vines, 1,808; alfalfa hay, 1,410; grain ration, 1,350; beet pulp, 150.

R. O. P. 839—Gewina Pearl Homestead Rose, 217,032: Reg. Holstein; — yrs.; fresh Oct. 16, 1919 and Nov. 2, 1920; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 9,986 lbs.; fat, 372.1 lbs.; test, 3.73 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 6,150; pea silage, 919; alfalfa hay, 30; pea vines, 60; grain ration, 100; beet pulp, 5.

R. O. P. 840—Johanna Pontiac Segis De Kol, 293,493: Reg. Holstein; — yrs.; fresh Jan. 1, 1920; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 14,456 lbs.; fat, 495 lbs.; test, 3.42 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 16,950; pea vines, 1,808; hay, 3,660; grain ration, 2,730; beet pulp, 150.

R. O. P. 841—Novelty Bell Ormsby, 229,169: Reg. Holstein; 7 yrs.; fresh Dec. 23, 1919 and Jan. 7, 1920; record from Feb. 1, 1920 to Feb. 1, 1921;

Production: Milk, 14,128 lbs.; fat, 466 lbs.; test, 3.3 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 6,000; pea vines, 919; alfalfa hay, 2,700; grain ration, 2,580; beet pulp, 150.

R. O. P. 842—Rosy: Gr. Holstein; 8 yrs.; fresh Sept. 23, 1920 and April 16, 1919; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 11,749 lbs.; fat, 455.5 lbs.; test, 3.88 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 6,450; pea vines, 904; hay, 3,100; grain ration, 97; beet pulp, 120.

R. O. P. 843—Spottie: Gr. Guernsey; — yrs.; fresh Oct. 8, 1919; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 9,398 lbs.; fat, 374.5 lbs.; test, 3.98 per cent.

Feed (lbs.): Pasture, 61 (days); silage, 6,450; alfalfa, 4,020; ration, 1,770; beet pulp, 150.

R. O. P. 844—Viola Beets Burke, 243,541: Reg. Holstein; — yrs.; fresh —; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 12,942 lbs.; fat, 463.5 lbs.; test, 3.5 per cent.

Feed (lbs.): Pasture, 61 (days); silage, 6,000; pea vines, 919; alfalfa hay, 3,100; grain ration, 2,490; beet pulp, 660.

R. O. P. 1103—Pearlie: Gr. Holstein; 5 yrs.; fresh March 1, 1919 and Jan. 13, 1920; record from Feb. 1, 1920 to Feb. 1, 1921.

Production: Milk, 9,313 lbs.; fat, 369.8 lbs.; test, 3.97 per cent.

Feed (lbs.): Pasture, 61 (days); silage, 6,000; pea silage, 919; hay, 3,000; grain ration, 1,680; beet pulp, 150.

ROBERTS AND HAMMOND ASSOCIATION

Lamb, W. A., Roberts

R. O. P. 810—Annie: Gr. Jersey; 7 yrs.; fresh Jan. 10, 1919 and Jan. 11, 1920; record from Jan. 10, 1920 to Jan. 10, 1921.

Production: Milk, 13,026 lbs.; fat, 547.9 lbs.; test, 4.21 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 5,875; hay, 1,574; grain, 3,194.

R. O. P. 811—Bonnie Belle: Gr. Jersey; 4 yrs.; fresh March 4, 1920 and Dec. 21, 1920; record from Jan. 10, 1920 to Jan. 10, 1921.

Production: Milk, 8,091 lbs.; fat, 365.1 lbs.; test, 4.5 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 5,875; hay, 1,574; grain, 2,804.

R. O. P. 812—Bora of St. Lambert 2d, 472,631: Reg. Jersey; 2 yrs.; fresh Feb. 20, 1920; record from Jan. 10, 1920 to Jan. 10, 1921.

Production: Milk, 6,673 lbs.; fat, 388.7 lbs.; test, 5.8 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 4,630; alfalfa, 1,262; grain, 2,718.

R. O. P. 813—Carrie: Gr. Jersey; 4 yrs.; fresh Feb. 8, 1920 and Dec. 18, 1920; record from Jan. 10, 1920 to Jan. 10, 1921.

Production: Milk, 8,940 lbs.; fat, 395.6 lbs.; test, 4.43 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 4,725; alfalfa, 1,574; grain, 2,537.

R. O. P. 814—Glenlyn Molly, 271,710: Reg. Jersey; 9 yrs.; fresh Dec. 18, 1919 and Jan. 12, 1921; record from Jan. 11, 1920 to Jan. 11, 1921.

Production: Milk, 8,240 lbs.; fat, 426.6 lbs.; test, 5.22 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 5,875; hay, 1,574; grain, 3,229.

R. O. P. 815—Jan. Ugene, 322,560: Reg. Jersey; 6 yrs.; fresh Dec. 19, 1919; record from Jan. 10, 1920 to Jan. 10, 1921.

Production: Milk, 9,094 lbs.; fat, 423.6 lbs.; test, 4.66 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 4,075; hay, 1,566; grain, 3,366.

R. O. P. 816—Lassie's Gold Fish, 322,563: Reg. Jersey; 5 yrs.; fresh Oct. 30, 1919; record from Jan. 11, 1920 to Jan. 11, 1921.

Production: Milk, 8,509 lbs.; fat, 473.8 lbs.; test, 5.6 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 5,875; hay, 1,574; grain, 3,790.

R. O. P. 817—Stockwell's Pretty Violet, 378,309: Reg. Jersey; 4 yrs.; fresh Aug. 3, 1919 and April —, 1920; record from Jan. 11, 1920 to Jan. 11, 1921.

Production: Milk, 5,902 lbs.; fat, 378.2 lbs.; test, 6.41 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 5,875; hay, 1,524; grain, 1,810.

R. O. P. 818—Valley View Polly, 275,655: Reg. Jersey; 8 yrs.; fresh Sept. 16, 1919; record from Jan. 11, 1920 to Jan. 11, 1921.

Production: Milk, 6,347 lbs.; fat, 395 lbs.; test, 6.22 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 5,875; hay, 1,574; grain, 2,445.

ROCK PRAIRIE ASSOCIATION

Dougan, W. J., Beloit

R. O. P. 1130—A-34: Gr. Guernsey; 9 yrs.; fresh Jan. 1, 1920; record from Jan. —, 1920 to Jan. —, 1921.

Production: Milk, 10,756 lbs.; fat, 451 lbs.; test, 4.19 per cent.

Feed (lbs.): Pasture, 120 (days); silage, 10,330; hay, 2,780; grain, 3,020.

R. O. P. 1131—B-15: Gr. Guernsey; 9 yrs.; fresh Jan. 4, 1919 and Dec. 4, 1919; record from Jan. —, 1920 to Jan. —, 1921.

Production: Milk, 10,433 lbs.; fat, 389.9 lbs.; test, 3.74 per cent.

Feed (lbs.): Pasture, 120 (days); silage, 10,180; hay, 2,960; grain, 3,100.

R. O. P. 1132—D-21: Gr. Guernsey; 3 yrs.; fresh Dec. 1, 1918 and Jan. 22, 1920; record from Jan. —, 1920 to Jan. —, 1921.

Production: Milk, 9,241 lbs.; fat, 366.1 lbs.; test, 3.96 per cent.

Feed (lbs.): Pasture, 120 (days); silage, 10,280; hay, 2,770; grain, 2,995.

R. O. P. 1133—E-9: Gr. Guernsey; — yrs.; fresh Nov. 11, 1919 and Oct. 27, 1920; record from Jan. 1, 1919 to Jan. 1, 1920.

Production: Milk, 9,236 lbs.; fat, 469.4 lbs.; test, 5.08 per cent.

Feed (lbs.): Pasture, 120 (days); silage, 10,180; hay, 2,800; grain, 3,040.

Stoney, Frank, Clinton

R. O. P. 1134—Dairy Maid: Reg. Holstein; 7 yrs.; fresh Sept. 2, 1919 and Sept. 28, 1920; record from Dec. —, 1919 to Dec. —, 1920.

Production: Milk, 10,150 lbs.; fat, 378.9 lbs.; test, 3.73 per cent.

Feed (lbs.): Pasture, 127 (days); silage, 7,090; hay, 1,430; grain, 1,625; green fodder, 450; beet tops, 300.

R. O. P. 1135—Roseland's Dairy Maid: Gr. Holstein; 8 yrs.; fresh Nov. —, 1919 and Sept. —, 1920; record from Dec. —, 1919 to Dec. —, 1920.

Production: Milk, 10,950 lbs.; fat, 368.4 lbs.; test, 3.37 per cent.

Feed (lbs.): Pasture, 127 (days); silage, 6,990; hay, 1,410; grain, 1,705; fodder, 600; beet tops, 300.

Wehinger, John & Son, Janesville

R. O. P. 1136—Gem Rigtje Johanna Bonheur, 359,825: Reg. Holstein; 6 yrs.; fresh April 15, 1919 and March 1, 1920; record from Dec. 1, 1919 to Dec. 1, 1920.

Production: Milk, 18,562 lbs.; fat, 647.6 lbs.; test, 3.49 per cent.

Feed (lbs.): Pasture, 60 (days); silage, 5,815; hay, 1,846; grain, 3,278; beets, 2,000.

R. O. P. 1137—Johanna Beauty Battles, 401,899: Reg. Holstein; 2 yrs.; fresh Nov. 15, 1919; record from Dec. 1, 1919 to Dec. 1, 1920.

Production: Milk, 14,649 lbs.; fat, 488.4 lbs.; test, 3.34 per cent.

Feed (lbs.): Pasture, 180 (days); silage, 6,720; hay, 1,850; grain, 1,620.

ROCKFIELD ASSOCIATION

Bast, Jacob B., Rockfield

R. O. P. 786—Colantha: Gr. Holstein; 4 yrs.; fresh ———; record from May 1, 1919 to May 1, 1920.

Production: Milk, 12,905 lbs.; fat, 411.8 lbs.; test, 3.18 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 10,566; hay, 2,335; bran, 1,788; gluten, 124; oats, 139; oil meal, 564; germ meal, 790; hominy, 139.

R. O. P. 787—Johanna: Gr. Holstein; 12 yrs.; fresh Aug. 18, 1918 and Dec. 4, 1919; record from May 1, 1919 to May 1, 1920.

Production: Milk, 11,684 lbs.; fat, 406.9 lbs.; test, 3.48 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 11,206; hay, 2,407; bran, 1,092; gluten, 124; oats, 139; oil meal, 516; germ meal, 790; hominy, 139.

R. O. P. 788—Julia: Gr. Holstein; 6 yrs.; fresh Aug. 25, 1918 and Aug. 9, 1919; record from May 1, 1919 to May 1, 1920.

Production: Milk, 12,340 lbs.; fat, 385.8 lbs.; test, 3.13 per cent.

Feed (lbs.): Pasture, 113 (days); silage, 11,176; hay, 2,407; bran, 1,139; gluten, 31; oats, 39; oil meal, 420; germ meal, 306; hominy, 139.

R. O. P. 789—Loney: Gr. Holstein; 2 yrs.; fresh Jan. 30, 1919 and Dec. 23, 1919; record from May 1, 1919 to May 1, 1920.

Production: Milk, 11,479 lbs.; fat, 392.3 lbs.; test, 3.41 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 11,206; hay, 2,407; bran, 1,136; gluten, 124; oats, 139; oil meal, 378; germ meal, 557; hominy, 139.

R. O. P. 790—Nelsie: Gr. Holstein; 11 yrs.; fresh March 17, 1918 and Dec. 10, 1919; record from May 1, 1919 to May 1, 1920.

Production: Milk, 11,885 lbs.; fat, 423.7 lbs.; test, 3.57 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 11,206; hay, 2,407; bran, 1,558; gluten, 124; oats, 139; oil meal, 516; germ meal, 790; hominy, 139.

R. O. P. 791—Paulina: Gr. Holstein; 4 yrs.; fresh Jan. 1, 1919 and Dec. 13, 1919; record from May 1, 1919 to May 1, 1920.

Production: Milk, 12,395 lbs.; fat, 408.7 lbs.; test, 3.22 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 11,206; hay, 2,407; bran, 1,279; gluten, 124; oats, 139; oil meal, 409; germ meal, 619; hominy, 139.

R. O. P. 792—Vera: Gr. Holstein; 6 yrs.; fresh Dec. 5, 1918 and Nov. 3, 1919; record from May 1, 1919 to May 1, 1920.

Production: Milk, 15,754 lbs.; fat, 495.9 lbs.; test, 3.15 per cent.

Feed (lbs.): Pasture, 122 (days); silage, 11,066; hay, 2,371; bran, 1,838; gluten, 124; oats, 139; oil meal, 549; germ meal, 790; hominy, 139.

Bast, Geo. B., Rockfield

R. O. P. 845—Bessie: Gr. Holstein; 8 yrs.; fresh Sept. 13, 1918 and Oct. 14, 1919; record from May 1, 1919 to May 1, 1920.

Production: Milk, 13,502 lbs.; fat, 408 lbs.; test, 3.02 per cent.

Feed (lbs.): Pasture, 149 (days); silage, 10,646; hay, 276; bran, 1,898; gluten, 161; germ meal, 154; oil meal, 401; cob meal, 468; middlings, 74.

R. O. P. 846—Nigger: Gr. Holstein; — yrs.; fresh ———; record from May 1, 1919 to May 1, 1920.

Production: Milk, 12,240 lbs.; fat, 401.8 lbs.; test, 3.28 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 10,816; hay, 2,710; bran, 1,796; gluten, 211; germ meal, 98; oil meal, 415; cob meal, 416; middlings, 74.

Hoelz, Mrs. Christ, Rockfield

R. O. P. 805—Bess: Gr. Holstein; 10 yrs.; fresh March —, 1919; record from May 1, 1919 to May 1, 1920.

Production: Milk, 10,710 lbs.; fat, 390.4 lbs.; test, 3.65 per cent.

Feed (lbs.): Pasture, 107 (days); silage, 12,975; hay, 2,499; bran, 696; gluten, 284; oats, 1,070; oil meal, 241; middlings, 52; dairy feed, 60; cob meal, 58.

Hoelz, Jacob N., Rockfield

R. O. P. 806—Clothilda Homestead Johanna Rue 2d: Reg. Holstein; 5 yrs.; fresh Sept. —, 1918 and July —, 1919; record from May 1, 1919 to May 1, 1920.

Production: Milk, 12,999 lbs.; fat, 500.4 lbs.; test, 3.85 per cent.

Feed (lbs.): Pasture, 107 (days); silage, 13,005; hay, 2,499; bran, 1,000; gluten, 463; oats, 1,069; oil meal, 554; dairy feed, 126; cob meal, 277.

Glumb, Edward, Rockfield

R. O. P. 926—No. 15: Gr. Holstein; 7 yrs.; fresh April —, 1919 and Feb. 7, 1920; record from May 1, 1919 to May 1, 1920.

Production: Milk, 10,573 lbs.; fat, 370.8 lbs.; test, 3.51 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 6,646; hay, 1,235; bran, 556; gluten, 589; oil meal, 161.

ROSENDALE ELDORADO ASSOCIATION

Braatz, E. H., Brandon

R. O. P. 640—Annie Laura Mutual Rex Segis, 237,524: Reg. Holstein; 5 yrs.; fresh Jan. 4, 1919 and Jan. 19, 1920; record from July 26, 1919 to July 26, 1920.

Production: Milk, 11,975 lbs.; fat, 425 lbs.; test, 3.25 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 7,040; hay, 1,650; beet pulp, 320; grain mixture, 2,015; dairy feed, 30; bran, 300; full value bran, 70; schumacher and bran, 300.

R. O. P. 641—Oasis Corona, 236,946: Reg. Holstein; 5 yrs.; fresh Oct. 21, 1918 and Jan. 3, 1920; record from July 26, 1919 to July 26, 1920.

Production: Milk, 12,525 lbs.; fat, 407 lbs.; test 3.25 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 7,040; hay, 1,680; beet pulp, 440; grain mixture, 2,230; Armour feed, 30; schumacher and bran, 150; bran, 70; Armour dairy ration and bran, 120.

Lawson, W. A., Rosendale

R. O. P. 927—Lucy: Gr. Guernsey; 4 yrs.; fresh ———; record from July 1, 1919 to July 1, 1920.

Production: Milk, 7,340 lbs.; fat, 373 lbs.; test, 5.08 per cent.

Feed (lbs.): Pasture, 134 (days); silage, 8,350; hay, 1,770; succotash, 915; true value stock feed, 808; ground oats, 232.

R. O. P. 928—Maud of Elmway, 40,510: Reg. Guernsey; 6 yrs.; fresh ———; record from July 1, 1919 to July 1, 1920.

Production: Milk, 7,025 lbs.; fat, 381.8 lbs.; test, 5.43 per cent.

Feed (lbs.): Pasture, 134 (days); silage, 8,320; hay, 1,770; Armour's dairy ration, 298; succotash, 1,110; true value dairy feed, 419; ground oats, 200.

R. O. P. 929—Maud's Beauty of Elmway, 58,732: Reg. Guernsey; 4 yrs.; fresh ———; record from July 1, 1919 to July 1, 1920.

Production: Milk, 7,070 lbs.; fat, 393.3 lbs.; test, 5.56 per cent.

Feed (lbs.): Pasture, 134 (days); silage, 8,600; hay, 1,720; Armour's dairy ration, 328; succotash, 1,195; true value stock feed, 419; ground oats, 180.

SABIN ASSOCIATION

Babb, John, Boaz

R. O. P. 768—Bessie: Native; 9 yrs.; fresh April 20, 1919 and April 6, 1920; record from March 1, 1920 to March 1, 1921:

Production: Milk, 8,856 lbs.; fat, 379.9 lbs.; test, 4.29 per cent.

Feed (lbs.): Pasture, 184 (days); silage, ———; hay, 3,610; grain, 1,036.

R. O. P. 769—Guernsey: Gr. Guernsey; 7 yrs.; fresh Dec. 17, 1918 and April 11, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 8,207 lbs.; fat, 382 lbs.; test, 4.65 per cent.

Feed (lbs.): Pasture, 184 (days); hay, 3,610; grain, 1,542.

R. O. P. 770—Pink: Gr. Holstein; 6 yrs.; fresh April 9, 1919 and April 13, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 10,815 lbs.; fat, 391.7 lbs.; test, 3.62 per cent.

Feed (lbs.): Pasture, 184 (days); hay, 3,610; grain, 1,542.

Brown, D. F., Boaz

R. O. P. 771—Jersey: Reg. Jersey; 8 yrs.; fresh April 20, 1919 and May 11, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 6,134 lbs.; fat, 366.9 lbs.; test, 5.98 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 3,450; hay, 1,800; oil meal, 352; bran, 454; oats, 229; corn, 102; barley, 224.

Brown, L. C., Boaz

R. O. P. 486—Spot: Gr. Ayrshire; 6 yrs.; fresh Jan. 22, 1919 and Feb. 1, 1918; record from Feb. 1, 1919 to Feb. 1, 1920.
Production: Milk, 6,719 lbs.; fat, 369.4 lbs.; test, 3.88 per cent.
Feed (lbs.): Pasture, 184 (days); silage, 2,732; hay, 1,990; grain mixture, 1,669.

Cooper, Joe, Richland Center

R. O. P. 772—May: Gr. Jersey; 8 yrs.; fresh Oct. 6, 1919 and Oct. 17, 1920; record from March 1, 1920 to March 1, 1921.
Production: Milk, 6,719 lbs.; fat, 379.9 lbs.; test, 5.65 per cent.
Feed (lbs.): Pasture, 184 (days); hay, 1,879; silage, 3,305; grain, 1,274.

Fowell, L. D., Viola

R. O. P. 773—Abby: Native; 7 yrs.; fresh March 1, 1919 and March 25, 1920; record from March 1, 1920 to March 1, 1921.
Production: Milk, 9,499 lbs.; fat, 382.3 lbs.; test, 4.02 per cent.
Feed (lbs.): Pasture, 184 (days); silage, 3,000; hay, 1,610; oil meal, 206; corn and cob meal, 145; oats, 327; bran, 222; barley, 121.

R. O. P. 774—Nervie: Native; 6 yrs.; fresh March 8, 1918 and March 1, 1919; record from Feb. 1, 1918 to Feb. 1, 1919.
Production: Milk, 10,275 lbs.; fat, 369.2 lbs.; test, 3.59 per cent.
Feed (lbs.): Pasture, 184 (days); silage, 5,875; hay, 1,865; grain, 1,709.

R. O. P. 775—Red: Native; 9 yrs.; fresh March 1, 1918 and March 6, 1919; record from Feb. 1, 1919 to Feb. 1, 1920.
Production: Milk, 8,569 lbs.; fat, 371.9 lbs.; test, 4.34 per cent.
Feed (lbs.): Pasture, 184 (days); silage, 5,875; hay, 1,865; grain, 1,489.

Kepler, Carroll, Boaz

R. O. P. 776—Gentle: Gr. Holstein; 7 yrs.; fresh March 24, 1919 and Feb. 20, 1920; record from March 1, 1920 to March 1, 1921.
Production: Milk, 10,793 lbs.; fat, 373 lbs.; test, 3.46 per cent.
Feed (lbs.): Pasture, 184 (days); silage, 4,180; hay, 1,720; grain, 1,530.

Looker, M. D., Viola

R. O. P. 777—Molly: Gr. Holstein; 3 yrs.; fresh Feb. 20, 1920; record from March 1, 1920 to March 1, 1921.
Production: Milk, 9,796 lbs.; fat, 369.3 lbs.; test, 3.77 per cent.
Feed (lbs.): Pasture, 184 (days); silage, 6,192; hay, 1,361; grain, 1,164.

McBain, Leslie, Viola

R. O. P. 778—Midget: Gr. Guernsey; 5 yrs.; fresh March 7, 1919 and Feb. 24, 1920; record from March 1, 1920 to March 1, 1921.
Production: Milk, 8,337 lbs.; fat, 398.9 lbs.; test, 4.78 per cent.
Feed (lbs.): Pasture, 184 (days); silage, 2,110; hay, 2,180; mixed grain, 915.

R. O. P. 779—Red: Gr. Guernsey; 8 yrs.; fresh March 7, 1919 and March 12, 1920; record from March 1, 1920 to March 1, 1921.
Production: Milk, 8,371 lbs.; fat, 392.9 lbs.; test, 4.69 per cent.
Feed (lbs.): Pasture, 184 (days); silage, 2,110; hay, 2,180; mixed grain, 772.

Tobison, R. P., Boaz

R. O. P. 780—Bessie: Native; 7 yrs.; fresh Nov. 30, 1919 and Dec. 5, 1920; record from March 1, 1920 to March 1, 1921.
Production: Milk, 9,336 lbs.; fat, 367.2 lbs.; test, 3.93 per cent.
Feed (lbs.): Pasture, 184 (days); silage, 5,194; hay, 1,448; oil meal, 555; bran, 555; corn, 314; oats, 393; barley, 261.

R. O. P. 781—Bob Tail: Gr. Jersey; 7 yrs.; fresh Sept. 1, 1919 and Oct. 7, 1920; record from March 1, 1920 to March 1, 1921.
Production: Milk, 7,155 lbs.; fat, 371.3 lbs.; test, 5.19 per cent.
Feed (lbs.): Pasture, 184 (days); silage, 5,194; hay, 1,448; oil meal, 581; bran, 581; corn, 581; oats, 437; barley, 268.

R. O. P. 782—Rhone Cow: Native; 5 yrs.; fresh Nov. 15, 1919 and Dec. 1, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 8,651 lbs.; fat, 395.5 lbs.; test, 4.6 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 5,194; hay, 1,448; oil meal, 499; bran, 499; corn, 289; oats, 355; barley, 231.

R. O. P. 783—Stifle: Native; 5 yrs.; fresh April 1, 1919 and March 1, 1920; record from April 1, 1920 to April 1, 1921.

Production: Milk, 8,604 lbs.; fat, 424.5 lbs.; test, 4.93 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 4,388; hay, 1,200; oil meal, 483; bran, 483; corn, 207; barley, 335; oats, 340.

R. O. P. 784—Stripper: Native; 6 yrs.; fresh Aug. 30, 1919 and Sept. 1, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 7,436 lbs.; fat, 394.6 lbs.; test, 5.31 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 5,194; hay, 1,448; oil meal, 524; bran, 524; corn, 233; oats, 381; barley, 351.

R. O. P. 785—Yellow: Native; 6 yrs.; fresh Jan. 1, 1919 and Feb. 10, 1920; record from March 1, 1920 to March 1, 1921.

Production: Milk, 9,453 lbs.; fat, 424.7 lbs.; test, 4.49 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 5,194; hay, 1,448; oil meal, 525; bran, 525; corn, 249; oats, 381; barley, 335.

SHAWANO ASSOCIATION.

Berglin, O. J., Shawano

R. O. P. 707—Princess Alma Korndyke, 360,483: Reg. Holstein; 4 yrs.; fresh Oct. 19, 1918 and Nov. 17, 1919; record from Nov. 1, 1919 to Nov. 1, 1920.

Production: Milk, 10,263 lbs.; fat, 369.5 lbs.; test, 3.6 per cent.

Feed (lbs.): Pasture, 214 (days); silage, 4,813; hay, 1,668; oil meal, 114; grain mixture, 1,161.

R. O. P. 720—Lady Whitefoot Bergsma Canary, 181,986: Reg. Holstein; 8 yrs.; fresh Feb. 21, 1919 and Jan. 25, 1920; record from Dec. 1, 1919 to Dec. 1, 1920.

Production: Milk, 11,172 lbs.; fat, 375.2 lbs.; test, 3.36 per cent.

Feed (lbs.): Pasture, 214 (days); silage, 4,813; hay, 1,653; grain mixture, 1,106; grain, 48.

Dittmann, Frank, Underhill

R. O. P. 708—Moore: Gr. Holstein; 11 yrs.; fresh Oct. 28, 1918 and Nov. 10, 1919; record from Nov. 1, 1919 to Nov. 1, 1920.

Production: Milk, 10,994 lbs.; fat, 474.1 lbs.; test, 4.31 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 8,569; hay, 1,446; grain mixture, 2,206; corn on cob, 175.

R. O. P. 709—Gem Rigtje De Kol Crescent 4th, 283,773: Reg. Holstein; fresh Dec. 8, 1919; record from Nov. 1, 1919 to Nov. 1, 1920.

Production: Milk, 11,993 lbs.; fat, 415.2 lbs.; test, 3.46 per cent.

Feed (lbs.): Pasture, 167 (days); silage, 8,244; hay, 1,446; grain mixture, 2,211; corn on cob, 175.

R. O. P. 710—Veeman Star, 425,113: Reg. Holstein; 2 yrs.; fresh Dec. 31, 1919; record from Jan. 1, 1919 to Jan. 1, 1920.

Production: Milk, 10,206 lbs.; fat, 387.8 lbs.; test, 3.74 per cent.

Feed (lbs.): Pasture, 198 (days); silage, 5,973; hay, 1,058; grain mixture, 1,741; corn on cob, 566.

Hildemann, Alex E., Belle Plaine

R. O. P. 711—Anabelle: Gr. Guernsey; 9 yrs.; fresh Nov. 8, 1918 and Nov. 22, 1919; record from Nov. 1, 1919 to Nov. 1, 1920.

Production: Milk, 8,160 lbs.; fat, 390.0 lbs.; test, 4.78 per cent.

Feed (lbs.): Pasture, 159 (days); silage, 5,446; hay, 621; fodder, 1,158; grain, 1,730.

R. O. P. 712—Mame: Gr. Guernsey; 7 yrs.; fresh Nov. 20, 1918 and Dec. 1, 1919; record from Nov. 1, 1919 to Nov. 1, 1920.

Production: Milk, 8,893 lbs.; fat, 385.5 lbs.; test, 4.33 per cent.

Feed (lbs.): Pasture, 159 (days); silage, 5,416; hay, 621; fodder, 1,158; grain, 1,481.

Koch, William F., Underhill

R. O. P. 713—Tilly: Gr. Holstein; 8 yrs.; fresh Oct., 1918 and Nov. 6, 1919; record from Nov. 6, 1919 to Nov. 6, 1920.

Production: Milk, 9,464 lbs.; fat, 406.4 lbs.; test, 3.67 per cent.

Feed (lbs.): Pasture, 164 (days); silage, 5,003; stover, 1,571; hay, 1,045; grain, 1,545.

Naber Farm Company, Cecil

R. O. P. 714—Molly: Gr. Holstein; 8 yrs.; fresh Nov. 1, 1918 and Dec. 18, 1920; record from Dec. 1, 1919 to Dec. 1, 1920.

Production: Milk, 9,464 lbs.; fat, 384.5 lbs.; test, 4.07 per cent.

Feed (lbs.): Pasture, 214 (days); silage, 4,420; hay, 1,250; fodder, 250; grain, 895.

Otto Brothers, Shawano

R. O. P. 715—Dixie: Gr. Holstein; 7 yrs.; fresh Nov. 15, 1918 and Nov. 17, 1919; record from Dec. 1, 1919 to Dec. 1, 1920.

Production: Milk, 8,664 lbs.; fat, 388.9 lbs.; test, 4.9 per cent.

Feed (lbs.): Pasture, 164 (days); silage, 4,979; hay, 1,440; Hexel, 230; grain mixture, 1,306; balanced ration, 362.

R. O. P. 716—Queen: Gr. Holstein; 4 yrs.; fresh Feb. 10, 1919 and Dec. 1, 1919; record from Dec. 1, 1919 to Dec. 1, 1920.

Production: Milk, 9,387 lbs.; fat, 366.0 lbs.; test, 3.9 per cent.

Feed (lbs.): Pasture, 152 (days); silage, 4,624; hay, 1,435; Hexel, 230; grain mixture, 1,306; balanced ration, 362.

R. O. P. 717—Rose: Gr. Guernsey; 10 yrs.; fresh Jan. 10, 1919 and Nov. 16, 1919; record from Dec. 1, 1919 to Dec. 1, 1920.

Production: Milk, 9,134 lbs.; fat, 374.1 lbs.; test, 4.09 per cent.

Feed (lbs.): Pasture, 214 (days); silage, 4,629; hay, 1,440; Hexel, 230; grain mixture, 1,305; balanced ration, 362.

Rousseau, G. R., Cecil

R. O. P. 718—Olga Dutchland, 213,167: Reg. Holstein; 6 yrs.; fresh March 6, 1920; record from Dec. 6, 1919 to Dec. 6, 1920.

Production: Milk, 12,829 lbs.; fat, 463.9 lbs.; test, 3.62 per cent.

Feed (lbs.): Pasture, 164 (days); silage, 4,335; hay, 1,591; grain mixture, 1,383.

Zingler, John, Route 1, Embarrass

R. O. P. 719—Nigger: Gr. Holstein; 7 yrs.; fresh Dec. 6, 1919 and Oct. 18, 1920; record from Dec. 1, 1919 to Dec. 1, 1920.

Production: Milk, 10,548 lbs.; fat, 407.4 lbs.; test, 3.86 per cent.

Feed (lbs.): Pasture, 214 (days); silage, 4,879; marsh hay, 1,050; clover, 455; grain mixture, 1,493.

ST. NAZIANZ ASSOCIATION

Christel, Albert F., Route 2, Valders

R. O. P. 622—Beauty No. 4: Gr. Holstein; 8 yrs.; fresh Nov. 29, 1918 and Nov. 1, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 9,831 lbs.; fat, 370.7 lbs.; test, 3.77 per cent.

Feed (lbs.): Pasture, 160 (days); corn silage, 9,698; alfalfa hay, 2,628; grain mixture, 1,731.

R. O. P. 623—Blue Bell No. 7: Gr. Holstein; 7 yrs.; fresh Nov. 24, 1918 and Nov. 6, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 10,984 lbs.; fat, 419.6 lbs.; test, 3.82 per cent.

Feed (lbs.): Pasture, 160 (days); silage, 9,698; alfalfa, 2,628; grain mixture, 2,001; mangels, 620.

Rabe, Geo., Route 1, Kiel

R. O. P. 624—Bessie: Gr. Guernsey; 4 yrs.; fresh Dec. 30, 1918 and Jan. 18, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 6,750 lbs.; fat, 396.1 lbs.; test, 5.86 per cent.

Feed (lbs.): Pasture, 153 (days); corn silage, 6,228; mixed hay, 2,240; grain mixture, 1,094.

R. O. P. 625—Blossom: Gr. Guernsey; 11 yrs.; fresh Nov. 17, 1918 and Nov. 6, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 9,692 lbs.; fat, 473.7 lbs.; test, 4.88 per cent.

Feed (lbs.): Pasture, 153 (days); corn silage, 6,228; mixed hay, 2,240; grain mixture, 1,773.

R. O. P. 626—Carlina: Gr. Guernsey; 8 yrs.; fresh Oct. 10, 1918 and Feb. 1, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 8,118 lbs.; fat, 380.5 lbs.; test, 4.68 per cent.

Feed (lbs.): Pasture, 153 (days); corn silage, 6,228; mixed hay, 2,240; grain mixture, 1,094.

R. O. P. 627—Fannie: Gr. Guernsey; 8 yrs.; fresh March 8, 1919 and March 13, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 7,718 lbs.; fat, 386.7 lbs.; test, 5.01 per cent.

Feed (lbs.): Pasture, 153 (days); corn silage, 6,228; mixed hay, 2,240; grain mixture, 810.

R. O. P. 628—Meta: Gr. Guernsey; 4 yrs.; fresh Nov. 24, 1918 and Jan. 7, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 8,132 lbs.; fat, 414.5 lbs.; test, 5.15 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,228; mixed hay, 2,240; grain mixture, 1,125.

R. O. P. 629—Nellie: Gr. Guernsey; 3 yrs.; fresh Jan. 25, 1919 and Dec. 20, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 8,452 lbs.; fat, 406.3 lbs.; test, 4.8 per cent.

Feed (lbs.): Pasture, 153 (days); corn silage, 6,228; mixed hay, 2,240; grain mixture, 1,280.

R. O. P. 630—Polly: Gr. Guernsey; 5 yrs.; fresh Oct. 3, 1918 and March 13, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 6,650 lbs.; fat 375.1 lbs.; test, 5.64 per cent.

Feed (lbs.): Pasture, 153 (days); corn silage, 6,228; mixed hay, 2,240; grain mixture, 868.

R. O. P. 631—Yellow Bird: Gr. Guernsey; 4 yrs.; fresh Nov. 16, 1918 and Nov. 29, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 7,706 lbs.; fat, 432.8 lbs.; test, 5.61 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 6,228; mixed hay, 2,240; grain mixture, 1,683.

STRATFORD ASSOCIATION

Keller, Harry R., Stratford

R. O. P. 632—Star: Gr. Holstein; 5 yrs.; fresh Jan. 2, 1919 and Jan. 12, 1920; record from Aug. 1, 1919 to Aug. 1, 1920.

Production: Milk, 10,971 lbs.; fat, 380.5 lbs.; test, 3.45 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 3,450; hay, 2,550; grain, 1,646.

Spindler, Jacob, Stratford

R. O. P. 633—Colantha Bess, 307,840: Reg. Holstein; 4 yrs.; fresh Oct. 7, 1918 and Nov. 25, 1919; record from Aug. 1, 1919 to Aug. 1, 1920.

Production: Milk, 9,642 lbs.; fat, 407.8 lbs.; test, 4.23 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 3,200; hay, 2,675; grain, 1,450.

UNITY ASSOCIATION

Benning, Herbert, Unity

R. O. P. 763—Dolly: Gr. Holstein; 9 yrs.; fresh Dec. 1, 1919; record from June 21, 1919 to June 21, 1920.

Production: Milk, 8,889 lbs.; fat, 409.2 lbs.; test, 4.60 per cent.

Feed (lbs.): Pasture, 168 (days); corn silage, 5,533; mixed hay, 1,868; bran, 499; flour middlings, 46; oats, 647; barley, 93; oil meal, 249; Wisconsin ration, 203; gluten, 172.

R. O. P. 764—Emma: Gr. Holstein; 12 yrs.; fresh Jan. 4, 1920; record from June 21, 1919 to June 21, 1920.

Production: Milk, 9,367 lbs.; fat, 366.4 lbs.; test, 3.91 per cent.

Feed (lbs.): Pasture, 168 (days); corn silage, 5,533; mixed hay, 1,868; bran, 448; flour middlings, 46; oats, 667; barley, 93; oil meal, 224; Wisconsin balanced ration, 276; gluten, 172.

Justman, Roy, Unity

R. O. P. 765—Bright: Gr. Shorthorn; 9 yrs.; fresh Jan. 22, 1919 and Feb. 12, 1920; record from July 25, 1919 to July 25, 1920.

Production: Milk, 8,188 lbs.; fat, 399.3 lbs.; test, 4.89 per cent.

Feed (lbs.): Pasture, 168 (days); silage, 5,895; hay, 1,850; oats, 140; bran, 264; oil meal, 80; Wisconsin balanced ration, 168.

R. O. P. 766—Grace: Gr. Shorthorn; 7 yrs.; fresh July 14, 1918 and Sept. 26, 1919; record from July 25, 1919 to July 25, 1920.

Production: Milk, 10,558 lbs.; fat, 457.4 lbs.; test, 4.33 per cent.

Feed (lbs.): Pasture, 168 (days); corn silage, 5,895; mixed hay, 1,850; barley, 120; cottonseed meal, 60; wheat bran, 217; oil meal, 77; Wisconsin balanced ration, 1,123.

WAUSAU MARATHON ASSOCIATION

Volhard, Anton, Route 1, Marathon City

R. O. P. 637—Daisy: Gr. Holstein; 9 yrs.; fresh Nov. 30 1919 and Dec. 22, 1918; record from Aug. 1, 1919 to Aug. 1, 1920.

Production: Milk, 9,838 lbs.; fat, 406.1 lbs.; test, 4.1 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 4,840; mixed hay, 1,910; grain mixture, 1,602.

R. O. P. 638—Dora 4th: Gr. Holstein; 9 yrs.; fresh Jan. 20, 1919 and Jan. 5, 1920; record from Aug. 1, 1919 to Aug. 1, 1920.

Production: Milk, 8,471 lbs.; fat, 369.5 lbs.; test, 4.3 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 4,510; mixed hay, 1,910; grain mixture, 1,397.

R. O. P. 639—Lady De Kol Pontiac Pet, 344,716: Reg. Holstein; 3 yrs.; fresh April 19 1919 and April 15, 1920; record from Aug. 1, 1920 to Aug. 1, 1921.

Production: Milk, 8,971 lbs.; fat, 369.7 lbs.; test, 4.1 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 3,750; mixed hay, 1,910; grain mixture, 1,130.

WILTON ASSOCIATION

Brandau, Henry Jr., Wilton

R. O. P. 544—Beaver: Gr. Guernsey; 7 yrs.; fresh Sept. 1, 1919 and Oct. 16, 1918; record from April 1, 1919 to April 1, 1920.

Production: Milk, 7,472 lbs.; fat, 425.2 lbs.; test, 5.72 per cent.

Feed (lbs.): Pasture, 188 (days); silage, 5,190; hay, 1,700; grain, 1,680; oil meal, 360.

Brandau, William, Wilton

R. O. P. 545—Bessie: Gr. Guernsey; 6 yrs.; fresh Jan. 25, 1920 and March 10, 1918; record from April 1, 1919 to April 1, 1920.

Production: Milk, 7,645 lbs.; fat, 388.7 lbs.; test, 5.08 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 5,410; hay, 1,620; feed, 1,104; oil meal, 24.

R. O. P. 546—Martha: Gr. Guernsey; 7 yrs.; fresh Nov. 15, 1919 and Nov. 20, 1918; record from April 1, 1919 to April 1, 1920.

Production: Milk, 8,303 lbs.; fat, 384.4 lbs.; test, 7.61 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 4,960; hay, 1,620; feed, 1,579; oil meal, 48.

R. O. P. 547—19 Rose: Gr. Guernsey; 6 yrs.; fresh Jan. 1, 1920 and March 20, 1919; record from April 1, 1919 to April 1, 1920.

Production: Milk, 9,418 lbs.; fat, 438.4 lbs.; test, 4.67 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 4,510; hay, 1,620; oil meal, 150; mixed feed, 794.

Heath, Clarence C., Wilton

R. O. P. 1171—Ann of Pine Grove: Gr. Guernsey; — yrs.; fresh July 1, 1919 and Nov. 30, 1920; record from June 1, 1920 to June 1, 1921.

Production: Milk, 7,500 lbs.; fat, 376.5 lbs.; test, 5.02 per cent.

Feed (lbs.): Pasture, 241 (days); corn silage, 4,830; mixed hay, 2,024; mixed grains, 1,930; corn stover, 70.

Stackman, Ed., Ontario

R. O. P. 548—Pin Teat: Gr. Jersey; 7 yrs.; fresh March 16, 1919 and April 10, 1918; record from April 1, 1919 to April 1, 1920.

Production: Milk, 7,123 lbs.; fat, 383.9 lbs.; test, 5.4 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 4,040; hay, 1,630; feed, 1,200; oil meal, 70.

R. O. P. 548a—Pin Teat: Gr. Jersey; 8 yrs.; fresh Sept. —, 1919 and Sept. 27, 1920; record from June 27, 1920 to June 27, 1921.

Production: Milk, 7,152 lbs.; fat, 376.9 lbs.; test, 5.27 per cent.

Feed (lbs.): Pasture, 183 (days); corn silage, 4,730; hay, 1,606; grain, 1,383.

R. O. P. 1148—Coaly: Gr. Jersey; 7 yrs.; fresh June 19, 1920; record from June 27, 1920 to June 27, 1921.

Production: Milk, 8,272 lbs.; fat, 410.8 lbs.; test, 4.97 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 4,730; hay, 1,606; grain, 893.

R. O. P. 1149—Nig: Gr. Jersey; — yrs.; fresh Sept. —, 1919 and Sept. 23, 1920; record from June 27, 1920 to June 27, 1921.

Production: Milk, 8,897 lbs.; fat, 431.7 lbs.; test, 4.85 per cent.

Feed (lbs.): Pasture, 183 (days); corn silage, 4,730; hay, 1,606; grain, 1,733.

Steinhoff Brothers, Wilton

R. O. P. 549—Bell: Gr. Guernsey; 8 yrs.; fresh Sept. 21, 1919 and Oct. 1, 1918; record from April 1, 1919 to April 1, 1920.

Production: Milk, 7,525 lbs.; fat, 373.5 lbs.; test, 5.09 per cent.

Feed (lbs.): Pasture, 173 (days); silage, 5,680; hay, 1,590; mixed feed, 2,000; oil meal, 20.

Verthien, John, Wilton

R. O. P. 550—Susin: Gr. Guernsey; 13 yrs.; fresh April 1, 1919 and May 22, 1918; record from April 1, 1919 to April 1, 1920.

Production: Milk, 8,073 lbs.; fat, 454.7 lbs.; test, 5.6 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 5,850; hay, 1,500; feed, 1,222; oil meal, 340.

Wallace, H. M., Norwalk

R. O. P. 551—Blossom: Gr. Jersey; 5 yrs.; fresh March 18, 1919 and March 12, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 7,353 lbs.; fat, 373.7 lbs.; test, 5.08 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 3,300; hay, 1,870; bran, 492; oats, 447; oil meal, 78; corn, 72.

R. O. P. 552—Interested Lady Fern, 354,348: Reg. Jersey; 5 yrs.; fresh March 18, 1919 and March 15, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 6,651 lbs.; fat, 372.7 lbs.; test, 5.60 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 3,300; hay, 1,870; stover, 575; bran, 428; oats, 425; oil meal, 108; corn, 123.

R. O. P. 553—Princess Frances, 360,185: Reg. Jersey; 5 yrs.; fresh March 16, 1919 and Feb. 18, 1920; record from April 1, 1919 to April 1, 1920.

Production: Milk, 7,614 lbs.; fat, 372.2 lbs.; test, 5.18 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 3,300; hay, 1,870; bran, 567; oats, 372; oil meal, 78; corn, 72.

R. O. P. 554—Trix: Gr. Jersey; 6 yrs.; fresh Aug. 30, 1919 and Sept. 7, 1918; record from April 1, 1919 to April 1, 1920.

Production: Milk, 6,567 lbs.; fat, 385.8 lbs.; test, 5.94 per cent.

Feed (lbs.): Pasture, 183 (days); silage, 3,300; hay, 1,870; stover, 520; bran, 522; oats, 522; oil meal, 201; corn, 72.

R. O. P. 1172—Stub of Pine Grove: Gr. Guernsey; — yrs.; fresh March 3 1920 and Feb. 28, 1921; record from June 1, 1920 to June 1, 1921.

Production: Milk, 7,827 lbs.; fat, 400.6 lbs.; test, 5.12 per cent.

Feed (lbs.): Pasture, 241 (days); corn silage, 4,830; alfalfa hay, 2,024; grain, 2,247; corn stover, 70.

WOOD COUNTY NO. 2 ASSOCIATION

Blodgett, C. E., Marshfield

R. O. P. 1138—Imp. Fulria of Sarnia, 73,751: Reg. Guernsey; 5 yrs.; fresh Oct. 23, 1920 and Sept. 23, 1919; record from May 1, 1920 to May 1, 1921.

Production: Milk, 6,471 lbs.; fat, 416.8 lbs.; test, 6.44 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 3,560; mixed hay, 2,000; alfalfa, 425; Maxima, 1,004; bran, 180; barley, 180.

R. O. P. 1139—Imperial Fyzieda of Sarnia, 73,759: Reg. Guernsey; 5 yrs.; fresh Jan. 6, 1921 and Jan. 15, 1920; record from May 1, 1920 to May 1, 1921.

Production: Milk, 6,522 lbs.; fat, 383.5 lbs.; test, 5.88 per cent.

Feed (lbs.): Pasture, 153 (days); silage, 3,560; mixed hay, 2,000; alfalfa, 425; Maxima, 716.

Coombs, E. C., Marshfield

R. O. P. 1140—Star: Gr. Holstein; 3 yrs.; fresh Dec. 15, 1919 and Nov. 2, 1920; record from May 1, 1920 to May 1, 1921.

Production: Milk, 11,220 lbs.; fat, 422.9 lbs.; test, 3.77 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 7,350; hay, 2,260; grain, 3,124.

R. O. P. 1141—Topsy: Gr. Holstein; 6 yrs.; fresh Jan. 17, 1920 and Nov. 30, 1920; record from May 1, 1920 to May 1, 1921.

Production: Milk, 9,547 lbs.; fat, 441.3 lbs.; test, 4.63 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 6,750; hay, 2,560; grain, 2,169.

Jensen, John R., Marshfield

R. O. P. 1169—Dolly: Gr. Holstein; 7 yrs.; fresh March 9, 1920 and May 1, 1919; record from May 1, 1920 to May 1, 1921.

Production: Milk, 8,670 lbs.; fat, 367.2 lbs.; test, 4.24 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 6,180; hay, 2,550; grain mixture, 1,813.

Porter, Claire W. & Son, Marshfield

R. O. P. 1142—Flossy: Gr. Guernsey; 6 yrs.; fresh Feb. 7, 1920 and Jan. 2, 1921; record from May 1, 1920 to May 1, 1921.

Production: Milk, 9,503 lbs.; fat, 375.6 lbs.; test, 3.95 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 4,350; hay, 2,555; grain mixture, 1,466; cottonseed and oil meal, 354.

R. O. P. 1143—Spot: Gr. Jersey; 8 yrs.; fresh April 10, 1920 and Feb. 15, 1921; record from May 1, 1920 to May 1, 1921.

Production: Milk, 10,061 lbs.; fat, 440.6 lbs.; test, 4.3 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 4,650; hay, 2,700; grain mixture, 2,203; oil and cottonseed meal, 295.

Stecker, Henry, Marshfield

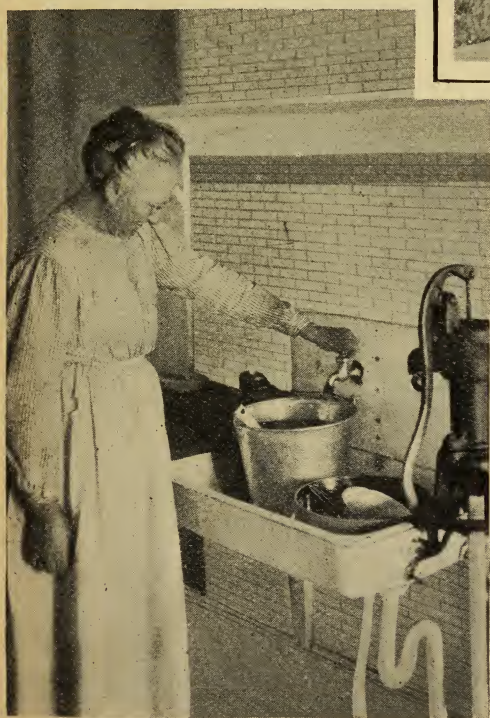
R. O. P. 1144—Princess: Gr. Holstein; 8 yrs.; fresh Oct. 15, 1920 and Dec. 30, 1919; record from May 1, 1920 to May 1, 1921.

Production: Milk, 13,056 lbs.; fat, 453.5 lbs.; test, 3.5 per cent.

Feed (lbs.): Pasture, 184 (days); silage, 4,950; mixed hay, 2,410; grain mixture, 2,428.

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Turn on the Water



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THE UNIVERSITY OF WISCONSIN.
MADISON

THE FARMER'S IDLE WIFE

In a Canadian government report it is said: "The farmer's wife is now so occupied with social affairs that she has lost the art of making butter and jam and doing the work of the farm that her grandmother did. This results in a great economic loss to the country."

The farmer's wife in early days got up at half-past two,
And shined the plows and milked the cows and put the prunes
to stew.

The breakfast for the hands she set upon the stroke of four,
And then she'd bake her bread and cake and scrub the kitchen
floor.

But nowadays the farmer's wife has time to call her own.
"Good gracious!" says the Government, "how idle she has
grown!"

The farmer's wife, in times gone by, brought up the calves and
lambs,
And sacked the oats and fed the shoats and smoked the hickory
hams,

And when she'd cook three great big meals she cheerfully arose
And with her churn sat down to earn the money for her clothes.
But now she often visits 'round and gossips, like as not,
"My goodness!" says the Government, "how worthless she has
got!"

The farmer's wife some years ago was wholly free from nerves;
Twelve hours a day she'd slave away at putting up preserves.
Six children dangling at her skirts, a seventh on her arm,
She'd gamely set herself to get the mortgage off the farm.
But now she sometimes takes a rest, like city women do.
"Great heavens!" cries the Government, "what is she coming to?"

The farmer's wife departed from this vale of toil and tears
For happier climes in those old times, when under thirty years.
The farmer got another mate, he somehow always found
The ideal wife who toiled through life and rested—underground.
But now sometimes her years add up their full allotted sum.
"Great Scott!" exclaims the Government, "how shiftless she's
become!"

—Canadian Farm.

Turn On The Water

NORMAN S. FISH

RUNNING WATER IN THE FARM HOME will afford as much or more comfort to the entire family than any other convenience which might be added. It will help to save the mother's time, health and strength; and to preserve the health of the family. The woman who can turn a tap in her kitchen, just where the water is needed, is relieved of carrying a large quantity of water a week. Moreover, running water for the farm home can be provided at a cost not above that of piping water to the barn for the convenience of the cattle.

All Need Fresh Water

The farm home should be supplied with water for drinking, for washing, and for the disposal of sewage. About 25 gallons a day for each person is the average requirement.

The supply should be fresh and free from contamination. While this is particularly true of drinking water, it is also true of water used for any other purpose. It is dangerous to use contaminated water even for cleaning purposes. See that the well or spring is where it will not receive the leeching from the manure pile or from any other source of pollution.

This supply should be abundant. A good water supply is essential to the indoor toilet and the sewage disposal plant, both of which add so much to the health and happiness of farm life.

Pumps Need Power

Generally the water has to be pumped. The windmill supplies power cheaply and well, but unfortunately wind power has not been developed as much as it should be, or as much as it likely to be in years to come. The gas engine is a valuable aid to the windmill. So also is the electric motor, which is now winning well deserved popularity. For the sake of economy, the same water system should supply water to both the barn and the house.

Gravity System Is Simple

The elevated or gravity system (Figure I) generally is the cheapest to install and will answer every purpose in an ordinary

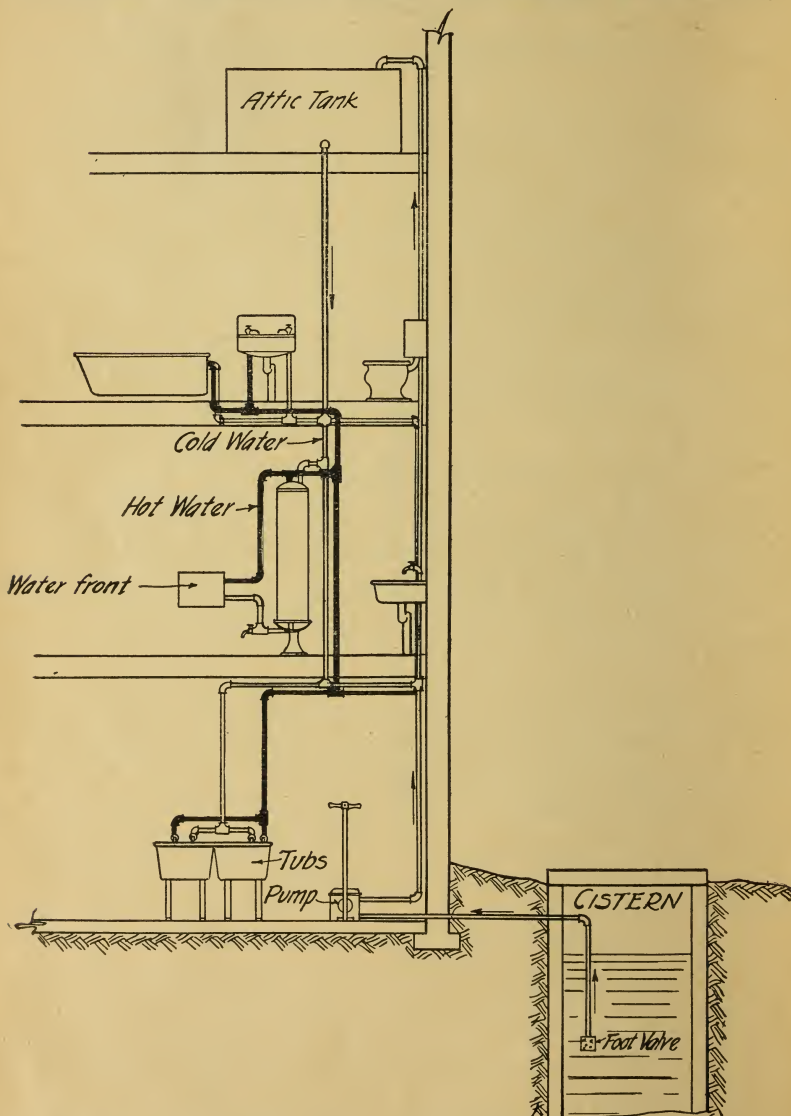


FIG. 1.—GRAVITY SUPPLY SYSTEM WITH ATTIC TANK

This system is well adapted to laundry purposes but water stored in an attic tank is not fresh enough for drinking. The hand pump is most common; and it is inconvenient to have an attic tank large enough to supply the toilet.

home. It is only an elevated tank combined with a force pump. The water is sent to the tank by pump, and gravity furnishes the force for carrying it to various parts of the house. The tank may be placed in the attic of the house, for house use only, or in the barn for stable use or on a tower for both uses. The tank in the house is often limited in size, due to space or else the construction of the house may prohibit a heavy load.

Wood tanks are probably the best in that they do not sweat nor rust, are easier to erect, and are not so apt to freeze. Galvanized tanks also may be used, provided a "sweat pan" is used to care for "sweat" and overflow. Such a pan must have an outlet to the sink or to the outside. An exposed tank in the northern part of the state is not advisable on account of freezing.

One can figure the capacity of such a tank since one gallon of water occupies 231 cubic inches of space and weighs $8\frac{1}{3}$ pounds. To calculate the number of gallons the formula is: $D^2 \times .7854 \times H \times 7.48 =$ gals. Thus a steel tank 6 feet in diameter and 8 feet deep will hold 1,691 gallons. One could install such an outfit, not including fixtures, for about \$175. Either a windmill, a small gas engine, or an electric motor can be used to fill the tank. There is on the market an automatic float which will cause the motor to start and stop as the water becomes lowered or raised.

The advantages of this system are:

1. Simple to install.
2. Simple to operate.

Disadvantages:

1. Difficult to secure sufficient elevation to give a pressure of over 20 pounds to the square inch.
2. Not sufficient for fire protection.
3. Nearly impossible to keep water fresh.
4. Danger of freezing.

Artesian Wells and Hydraulic Rams

If a spring or flowing well on the farm has sufficient flow, a hydraulic ram (Figure 2) can be used. The ram can be installed so that a small quantity of water may be raised to a considerable height by using a small fall in a stream. A fall of 5 feet will raise water 40 feet, provided the supply pipe is 40 feet long. Only about one-seventh to one-tenth of the total quantity delivered to the ram can be raised, but the ram will work night and day.

Rams are made in various sizes and cost from \$25 to \$75. There are also manufactured double acting rams, whereby impure water can be utilized to deliver pure water. Rams are chiefly used for supplying a gravity system but in a few instances have been used to deliver water into a pneumatic tank where the lift is not too great.

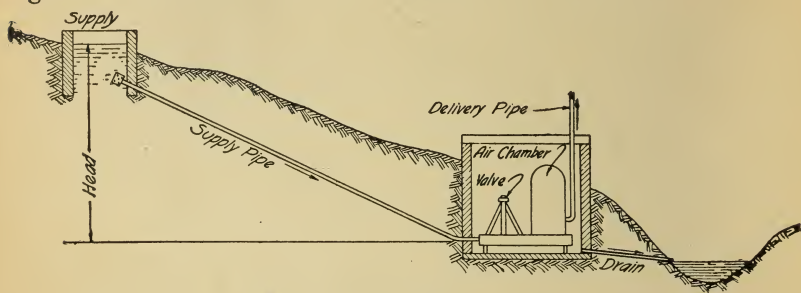


FIG. 2.—HYDRAULIC RAM

The supply pipe may come from either a spring or an artesian well, neither of which has force enough to lift the water to the desired height.

Hydro-Pneumatic Pressure

In the air and water (or hydro-pneumatic) system (Figure 3), air and water are stored in an air-tight galvanized iron tank. This system overcomes the objections to the gravity system in that it can be placed in the basement of the house or below freezing level in the ground near the well.

The principle on which this system operates is, as water is pumped in at the bottom and rises, the air above is compressed.

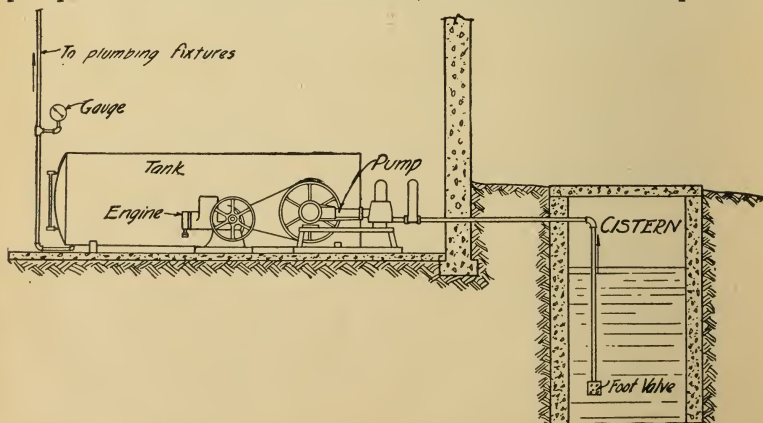


FIG. 3.—THE HYDRO-PNEUMATIC PLANT

The tank contains both water and air. The pressure of the air in the upper part of the tank is transmitted to the water in the lower part and forces it to rise to the plumbing fixtures when a faucet is opened.

This pressure increases as water is forced in. When a faucet is opened the expansion of the air forces the water out. This system must be provided with a pump that will pump air and water separately or both at the same time. This is necessary for when air stands under pressure, it is absorbed by the water and drawn off when a faucet is open. Hence, fresh air must be supplied to take care of this loss.

The power required to run such an outfit is small. A two horse power engine or motor will furnish enough power or a windmill will afford an ample supply. There is on the market a windmill pump equipped with a hydraulic cylinder which will throw the mill into and out of gear automatically. Thus it can be operated in connection with the pressure tank.

There are on the market, hydro-pneumatic systems which are equipped with pumps run by small electric motors which can be operated from either the city line or from the individual farm lighting plant. Little current is required by the motor and the system gives good satisfaction. The motor automatically starts and stops as the pressure falls or increases.

The working capacity of a tank in this system is one-third less than the total volume of the tank. The tank should be of sufficient size so as to necessitate pumping only two or three times a week.

A system with a 1,000 gallon tank, engine, pump and fittings will cost about \$500.

The advantages are:

1. No danger of freezing.
2. Sufficient pressure for fire protection.
3. No expense of elevated tank.

The disadvantages are:

1. Water which is stored in a tank contains sediment which will deposit, hence it should be provided with a manhole for cleaning.
2. Water may become flat or stale unless plenty of fresh air is provided as water is pumped into the tank.

Pneumatic Pressure (Fresh Water)

The fresh water or pneumatic system (Figure 4) delivers water direct from the well to the faucet, using compressed air as power. This system consists of an engine or motor, air pump, air tank and a special pump having two cylinders. The pump is rather complicated and is the expensive part of the system. The pump is placed in the well under water where compressed air is piped to it. The

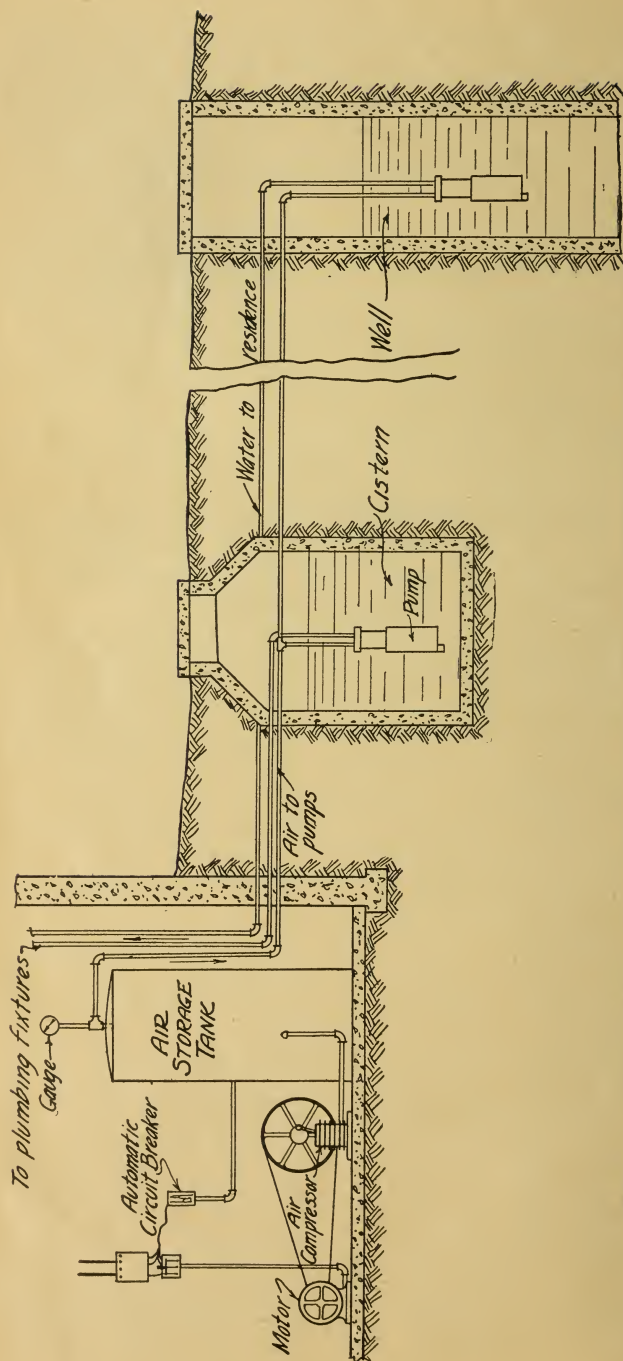


FIG. 4.—FRESH HARD AND SOFT WATER GETTING PRESSURE FROM THE SAME TANK

There is no water in the pressure tank. That contains only compressed air which forces the water from the well or cistern to the faucet. With electric power, automatic control of the pressure is possible.

valves work automatically and cause a continuous flow. The tank is practically the same as that used in the hydro-pneumatic system but built to withstand high pressure. On opening the faucet, the pressure is released and air in the tank rushes into the pump under water and forces water out through the faucet that is open. When the faucet is closed, the action ceases. The same tank can be used to operate both cistern and well as shown in the figure.

The advantages of this system are:

1. One air storage tank will supply both hard and soft water by providing extra pump.
2. Fresh water at all times.

The disadvantages are:

1. Sand in water causes leaky valves.
2. Not suitable to raise water over 150 feet.

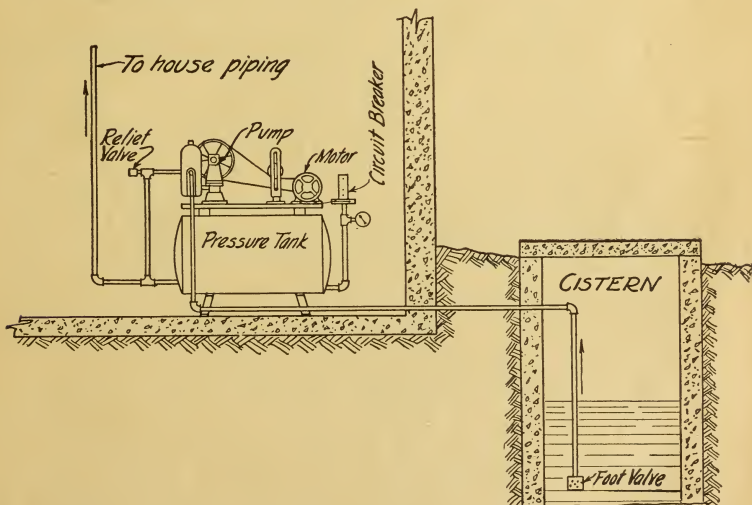


FIG. 5.—A COMPACT AUTOMATIC SYSTEM

This tank contains both air and water which is fresh only when large quantities of water are used. This system is commonly used to supply the toilet or drinking faucet with water from a well.

Automatic Pressure

The automatic system (Figure 5) is a small electrically operated unit. The motor automatically starts and stops as the pressure increases and decreases. Little current is required to operate the motor and the system gives entire satisfaction. Where electric current is not available, a gasoline engine driven pump can be used. This type of outfit, of course, would be automatic.

The tank is very small, thus insuring fresh water at all times. Some of the outfits have a special arrangement of piping whereby water can be pumped directly from the well without entering the tank.

Tankless Systems

Tankless automatic systems as shown in Figure 6 are on the market. These systems, since they have no storage tank, are small, compact, and operate by electricity only. The unit is equipped with an automatic pressure control switch so that when a faucet is turned on the pressure drops and the pump starts immediately. On turning off the faucet, the pressure rises and the motor stops.

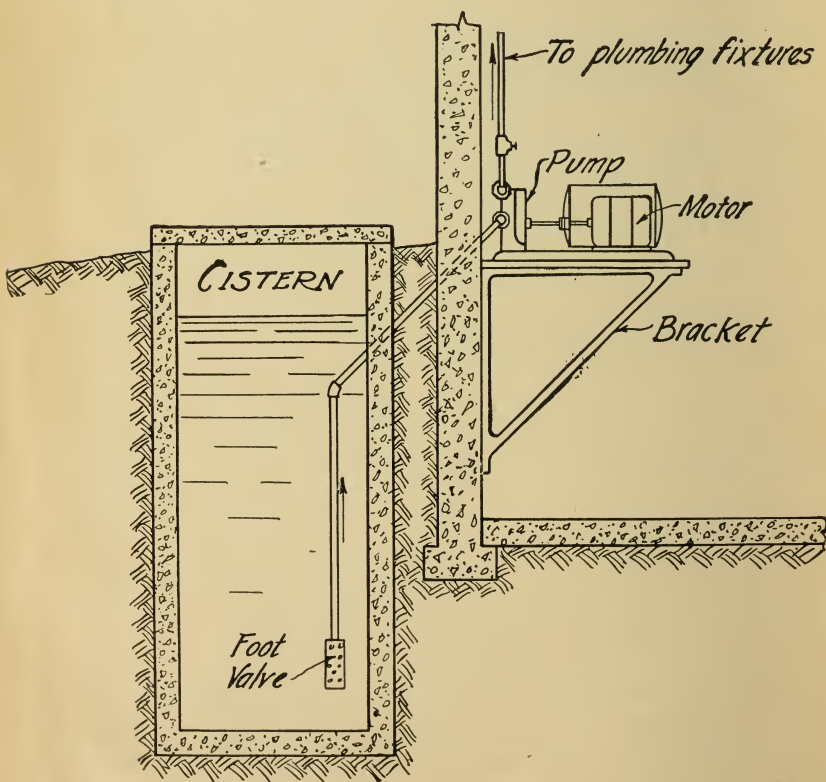


FIG. 6.—TANKLESS SYSTEM

An automatic tankless electric water system, which operates by electricity only. It automatically furnishes fresh water at every faucet. It is especially adapted for shallow well pumping.

The system requires little current and gives satisfaction. The outfit is simple and has few parts, hence there is little about it to get out of order.

Sewage Disposal

A water supply both necessitates and aids a sanitary sewage disposal system. The simple, inexpensive, two-chamber septic tank (Figure 7) is most satisfactory. It can be located at any convenient place other than near a well. The tank may be covered completely so there need be no objection to having it in the yard.

The settling chamber receives the sewage and permits bacteria to reduce the solids to liquids and gases. Solids settle to the bottom to await such bacterial action. A scum forms on top immediately beneath which is comparatively clear water which flows

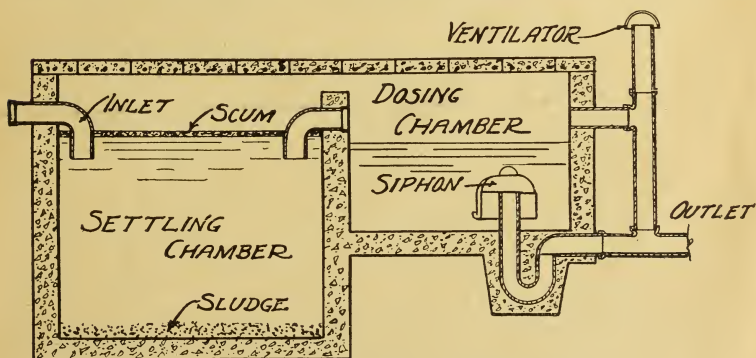


FIG. 7.—TWO CHAMBER SEPTIC TANK

By means of the septic tank, the disposal of sewage on the farm is a simple problem.

into the dosing chamber. The siphon causes the dosing chamber to empty after the liquid content has reached a certain height, thus flushing the distributing system below the outlet. The distributing system consists of from 100 to 500 feet of drain tile laid, not deep, usually about 18 inches in the soil. In these tile the air permits aerobic bacteria to complete the purification of the water.

A simple chamber septic tank has no dosing chamber. The liquid content runs directly and slowly from the settling chamber to the distributing system, without the intermittent and violent flushing that carries the water to the far end of the distributing system. This slow seepage sometimes causes water logging near the tank instead of an even distribution over the entire system as is desirable.

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Keep the Stump Puller Working



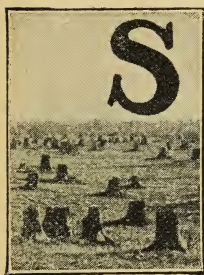
EXTENSION SERVICE OF THE COLLEGE OF AGRICULTURE
THE UNIVERSITY OF WISCONSIN
MADISON

NORTHERN WISCONSIN has not enough cleared acres today to support its existing flocks and herds, even though in 13 of these counties the average amount of livestock is five cows (or their equivalent) or less per farm. This condition is, of course, shown by the heavy importations of feed, but it can also be conclusively shown from another angle. The 17 strictly cut-over counties contained as reported in the last census, 344,000 livestock units (counting six sheep or hogs one cow unit), while in those same counties there were only 675,000 acres cleared and actually in use. On the basis of the produce of $2\frac{1}{2}$ acres per livestock unit to insure sufficient forage to carry stock through the winter in addition to summer pasturage, it is apparent that there is an actual shortage of 175,000 acres in those particular counties. With this situation it is no wonder that millions of money has to be paid out to maintain existing herds, let alone the natural increment which should normally develop. The purchase of raw materials imported from the outside by a northern settler as a rule is the wholly unjustifiable expense. Profitable livestock farming cannot be maintained when rough feeds and forage are bought. Even though alfalfa hay can be purchased in the West for a few dollars per ton, it costs from \$20 to \$25 per ton when it is delivered in Wisconsin. Under these circumstances our forage acreage needs material expansion, for that matter in the southern as well as in the northern part of the state.

H. L. Russell.

Keep the Stump Puller Working

JOHN SWENEHART



SEVERAL HUNDRED STUMP PULLERS now owned in Wisconsin should be repaired, equipped, and greased for at least 100 days' work in 1922. These idle pullers are one reason that 17 cut-over counties are paying out over \$4,000,000 for feed this year.

"Cash money" is going to be scarce in 1922; and thinking farmers are planning on using their labor to better advantage than ever. Rising taxes and normal farm prices are forcing farmers to make the unproductive land work and earn its way. Uncleared land is like a hired man who eats and gets his wages regularly but does not work. Better farming this year means making money spread over more acres. Lower cost of production by making all the land work on new farms.

Stump Pullers Reduce Labor

Stump pullers have a place on farms in almost every part of Wisconsin's cut-over area. Where stumps are 30 or more to the acre, where the fine fibrous roots have decayed and where the soil is not too wet and heavy, good land clearers are making money and progress with pullers.

We all like explosives and will use them as far as our money will go, and where conditions are not suitable for a puller we should push dynamite as much as we can. This circular is calling attention to the wisdom of getting pullers now owned into use. If a stump puller can be rented for \$1.50 per day or less and three men be organized to use it, the actual "cash money" paid out per stump will be less than five cents in addition to dynamite where needed. Fifteen days' time of three men has often resulted in fifteen acres of stumps well pulled and the soil most removed. Sound pieces may then be piled for burning or in neat piles for fuel use. Stump fence rows

are unsightly, reduce the value of the farm for loans, and also cultivate careless habits. Five acres of new land is needed on every farm. Let's have one cleared acre pay the taxes on more of our forties.

Pilers Can Be Home Made

It is suggested that pullers be rented to neighbors at a reasonable charge a day for wear and breakage on machine. Pilers can be made in the community at small expense where needed. A piler need not cost over \$30 to \$40 if some parts are made locally. Get



FIG. 1.—A GOOD TAKE-UP SAVES TIME

Hook the choker high on stump. The take-up permits pull to start at once without winding in slack cable.

plan from the College of Agriculture, Madison. Cables for piler can often be salvaged from an old log jammer.

Keep Stump Puller In Repair

Successful stump puller operators are using various items of equipment but the following works well:

1. Capstan puller fitted with 100 feet of main line three-fourths-inch cable. Outer end of cable is so fitted with sockets that extensions of 50 feet or more of

cable can be easily attached. Long anchor cable is needed. Puller should have ratchets attached and in good condition. Sweep should be stout and if old, it should be replaced before it goes to field. For two good horses the sweep should be about 10 or 12 times as long as the diameter of the drum. A longer sweep will help if one horse is used. It is better to use dynamite or a power pulley than to break the cable. Too long a sweep with a good team will break it. A good team will pull 1,000 or 1,200 pounds in a pinch and 25,000 pounds pull will break a good three-fourths-inch cable. Heavier pulls will get big pieces that are difficult to handle afterwards, so use dynamite and split. Some men use seven-eighths-inch cable. It is

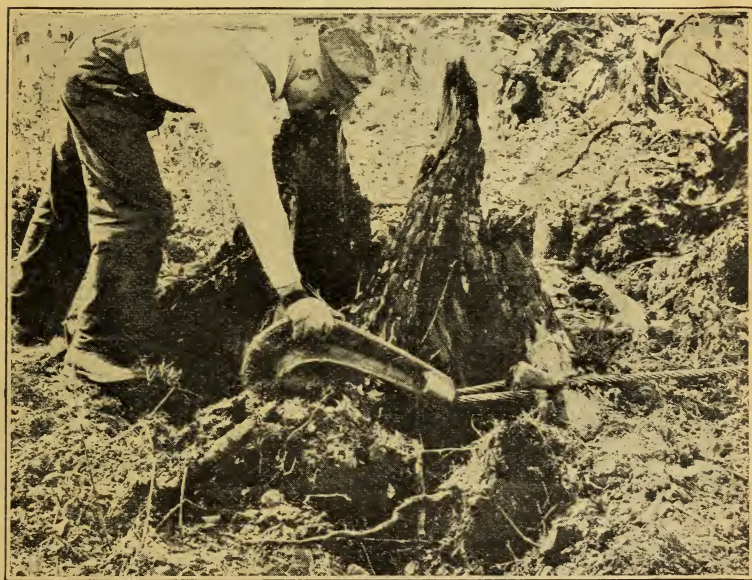


FIG. 2.—ROOT PLOW GETS STUBBORN STUMPS

This is a good tool to use for stumps when the tops are gone. The plow should not be too heavy.

stronger, heavier, stiffer, and often pulls pieces too large to handle. Greased bearings save men and team and get more stumps out.

2. One or two power pulleys are a part of the complete equipment.

3. Two take-ups are needed to operate puller at full capacity. The take-up can be bought to fit any size cable on ma-

chines now owned. The take-up permits a stump to be attached anywhere along the pull line without reeling all the cable in.

4. A root plow will help to get hold of the roots and stumps with tops gone. A good size weighs about 50 pounds. That is heavy enough to drag around. Sometimes two root plows are handy to grab in two places on large blinds or rotten tops.

5. Other tools are double bit ax, two grub hoes, crowbar, shovel, and two skidding chains or short length of three-eighths-inch cable fitted with hooks on each end.

6. Old outfits can be put in shape easily and equipment secured. Grease carefully. Grease old cable with oil soaked waste or rags. Grease will soon soak in and cable will be smoothed up. Grease cable when it is not in use.

First Aid

For Beginner

1. Set puller on level ground, higher than stumps to be pulled if possible, so cable will be low for team to pass over. Select stout

anchor stump. With ax cut notches for anchor cable as close to the ground as possible.

2. Crack any large stumps with small charges of dynamite if they will be too large to handle or if they will bring up too much soil. Place charges shallow and close to wood of stump for splitting.

3. Fasten cable on stump so no sharp bends are made in cable to weaken or break it. Hook as high as possible on stump to be pulled and thus get leverage.

4. Use grub hoe on stump just as it comes from the ground while the soil is over the hole. Stop team and knock off soil. It pays to get it off.

5. If cable seems to be coming off before stump is out, throw chain around an exposed root and hook to cable ahead of take-up. This will pull the stump on out without hooking over again. A short cable with hooks on each end works well here, too. This scheme is also good with the root plow.

6. Dig a place to tie chain around blinds and small roots. Use grub hoe to make a good place to hook the root plow.

7. A block of wood, or piece of stump, thrown in front of top of stump as it falls after being pulled will make it easier to

remove cable from pulled stump. The other take-up can be put on an exposed root and stump tipped over again to remove cable which sometimes gets fastened.

8. Three men make a good crew on a puller. Surely every man can get at least two neighbors to work with him for a few days. This is not a neighborly duty. It is just good business. Any stump puller owner who does not keep his outfit



FIG. 3.—EASY TO HANDLE AFTER PULLING

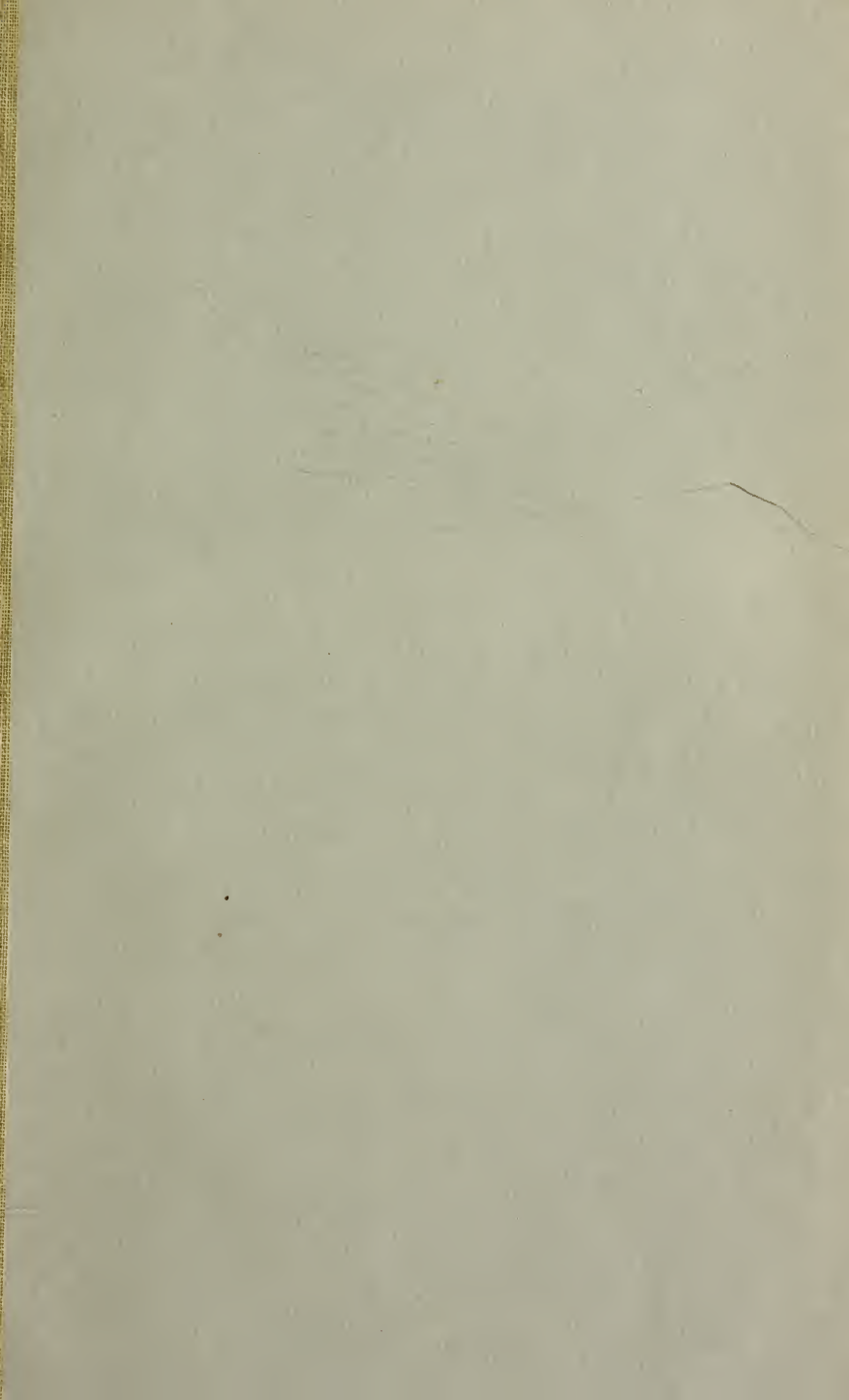
If a light load of dynamite is used, the large stumps are split, so that they can be pulled easily with a puller and then piled.

busy is just keeping a hired man without getting any work. If he has no stumps, he can sell his puller to a neighbor who needs it.

If you have a puller and live in a county where there is a Land Clearing Association and a County Agent, get in touch with them. They will help you keep your machine busy. The neighbors' clearing helps you. If you have no puller, he may help you to get the use of one.



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